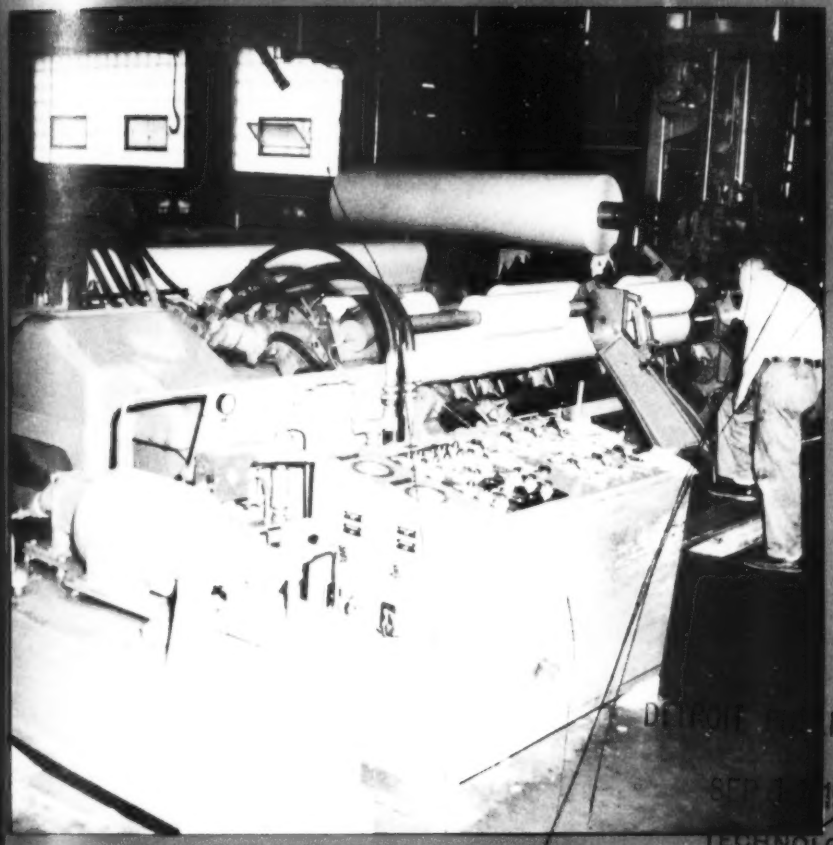
SEPTEMBER 1960

The Paper Industry



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SEP 1960
TECHNOLOGY DEPARTMENT

The Model 680 winder installed at Nicolet Paper Corp.'s mill is believed to be the world's largest duplex winder.

- Nicolet's new paper machine
- Semi-hydrotropic pulping
- Application of lubricants
- Market for bonded fabrics

Publishers of PAPER AND PULP MILL CATALOGUE

BOLTON *Microlyzed* JORDAN FILLINGS ARE

FIRST IN SALES!

BECAUSE BOLTON WAS —

FIRST to develop special metals for fillings

FIRST to install complete in-plant heat treating facilities

FIRST to install instrument controlled wood drying kilns

FIRST to install dynamic balancing of filled plugs as standard procedure

FIRST to install and use electronic equipment to inspect knives

FIRST to hardness test each bar in every filling

FIRST to import and use Bethabara for wood separators

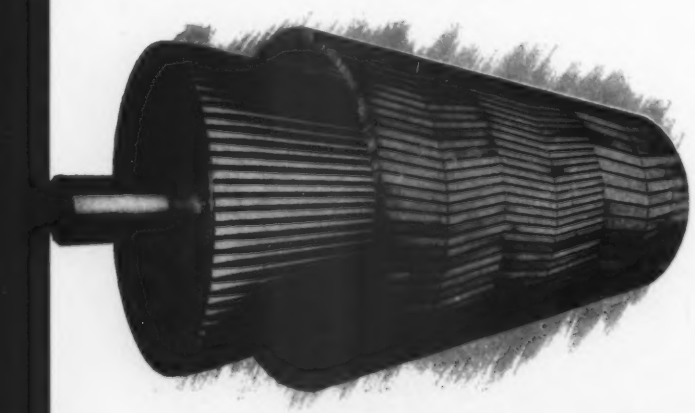
FIRST to introduce Microlyzed custom processing

There is no substitute for experience

It takes more than metal and wood to make a Jordan filling. The kind of metal selected and the way it is processed make a world of difference. The same is true of wood separators and the assembly of the knives and woods.

What matters most is *performance*. That is why Bolton Microlyzed Fillings should always be your first choice. It is with most papermakers.

With Microlyzed fillings you can rely on uniform, effective stock treatment every time. You will find them equal to any refining requirements with more to spare. Microlyzed fillings give long periods of even, uniform wear from every knife in the set, with the proper balance of wear resistance and toughness. Wear between plug and shell knives can be equally balanced.



There is no substitute for Quality

It takes a variety of specialized, highly developed skills to make fillings that out-perform all others. For instance, the photomicrostructural analysis of all raw stock and destructive mechanical properties testing determine exact heat treating requirements. Quality control serves as a double check in meeting established standards through every step of custom processing. Finally, non-destructive tests guarantee that these high standards of quality are present in every set of fillings before shipping — palletized, or in reinforced, sealed, corrugated cartons.

Bolton Microlyzed Fillings are available for every size and make of Jordan currently in use. Included are Wedgeless, Ring Type, Hydro-truss, Hydroflex, Boltobar and others of special design. Our Technical Advisory Service will gladly help you select fillings for your particular requirements.

Microlyzed fillings are unequalled for balanced refining, economy of long life, uniformity, strength, wear resistance and the ease of stripping and refilling — more reason why Microlyzed fillings are *first in sales*.

Next time specify Microlyzed Fillings by Bolton — the world's largest fillings manufacturer.

BOLTON EMERSON
TRADE MARK

John W. Bolton & Sons, Inc. and The Emerson Manufacturing Company, Division

Lawrence, Massachusetts

For more data circle 101 on Post Card

Lick paper drying problems with Dearborn's Super Film

If slow paper drying on your rolls is limiting your production, it will pay you to investigate Dearborn's Super Filmeen treatment.

When this specially formulated filming amine coats the interior metal surfaces of the drier rolls, dropwise condensation results. This increases the heat transfer rate . . . permits higher drier roll speeds before rimming is induced . . . materially expedites the drying process.

A further gain in the heat transfer rate is achieved by the action of the filming amines in removing and preventing scale and corrosion products which act as a heat transfer barrier.

Measurable increases in both production and efficiency of steam utilization result. As a bonus, treatment with Super Filmeen gives complete corrosion protection to the entire condensate and boiler feed systems as well as wet steam areas in turbines.

Call a Dearborn engineer for information on specific applications in your mill. Or write Dept. PS-960 for detailed Technical Bulletin.

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with a PURPOSE

Swenson keeps an eye on every Swenson Evaporator, Crystallizer, Dryer, Pulp Washer and Filter built, installed, and operating. Swenson follows through because they don't believe in "silent sentinels"—equipment that sits and works all by its lonesome. Not on your life. They feel that equipment—like engineering—needs backing.

That's part of the Swenson way of doing business—service with a purpose . . . expert *lifetime* engineering service that assures you of controlled processing and production. It starts with preliminary planning . . . follows up with operational recommendations based on experience . . . and continues with post-installation checks that keep your equipment in prime working order.

IMPORTANT BOOKLET! Ask, or write, for "An Open Door"—a 12-page booklet that explains the Swenson Approach toward solving your processing problems. *Swenson Evaporator Company, 15653 Lathrop Avenue, Harvey, Illinois. In Canada: Whiting Corporation (Canada) Ltd., 350 Alexander Street, Welland, Ontario, Canada.*

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The Paper Industry

Technology • Engineering • Management • Production

VOLUME 42 **NUMBER 6** **SEPTEMBER 1960**

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BRIGHTNESS
AND OPACITY

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From our point of view..

The market potential for bonded fabrics

Production of bonded fabrics, as shown by P. H. Sherwood in this issue, has increased from 15,000 lbs. in 1945 to an estimated 90,000,000 lbs. in 1959. Such tremendous increase of the bonded fabrics output is attracting more and more paper manufacturers to this potentially lucrative market.

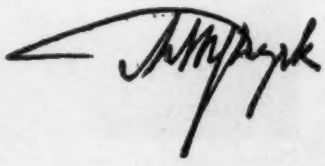
Anticipated production by 1964, according to the author, will be 170,000,000 lbs., just to meet the demands of a normally expanding market. Should the expected penetration into the textile market progress with any acceleration, the 1964-output could easily reach a 225,000,000 lbs. figure. Moreover, discovery of new areas of application could boost the anticipated output figures to even higher levels.

Progress in bonded fabrics has been especially rapid in the last three-year period, commensurate with some relaxation of the secrecy associated with the basic technology involved in this process and allowing a wider participation of technical and engineering talent in the development of improved techniques and the use of more diversified materials.

One of the most essential factors in bonding fibers appears to be the proper selection and use of binders, the average content of which in the finished product amounts to about 30 per cent. The binders used for this purpose include polyvinyl alcohol and acetate, starches, casein, cellulose xanthogenates, butadiene styrenes and acrylonitriles, acrylates and nitrile latices.

The end-uses of bonded fabrics are extremely varied and include application in (1) durables, such as thermal insulation, wall coverings, interlinings in apparel and shoes, air filters, and backing for vinyl-coated fabrics and film used for automobile seat covers which have an annual market potential of 75,000,000 lbs.; (2) semi-durables, such as vacuum cleaning bags, polishing cloths, seed carpeting, window drapes, etc.; and (3) disposables, such as napkins, guest towels, filter fabrics, medical dressings, pillow cases, bed sheets, etc.

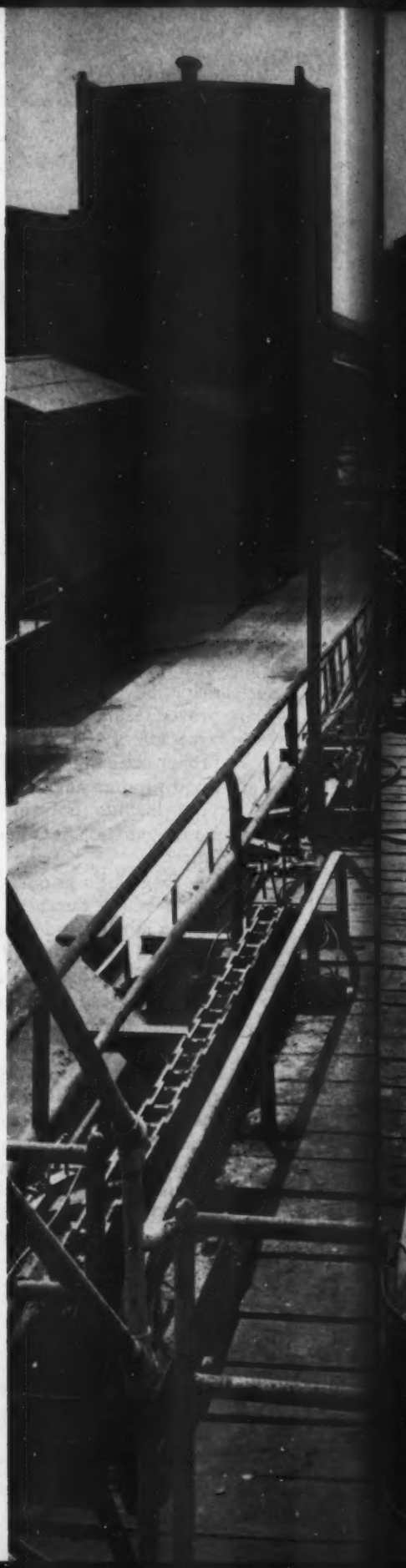
The greatest market potential for bonded fabrics would seem to be in their application in wearing apparel, the current use for which has been estimated at 10,000,000 lb. Disposable underwear, workers' clothes and uniforms, school children's apparel are possibly among the items that would receive early public acceptance. Eventually, and conceding to the pressure of the demands of modern living and the associated desire for convenience, even Dior might condescend to add his stamp of approval to the inclusion of disposable bonded fabrics in the design of fashionable dresses and thereby remove the last vestiges of resistance toward the acceptance of these materials as suitable wearing apparel for any and all occasions.

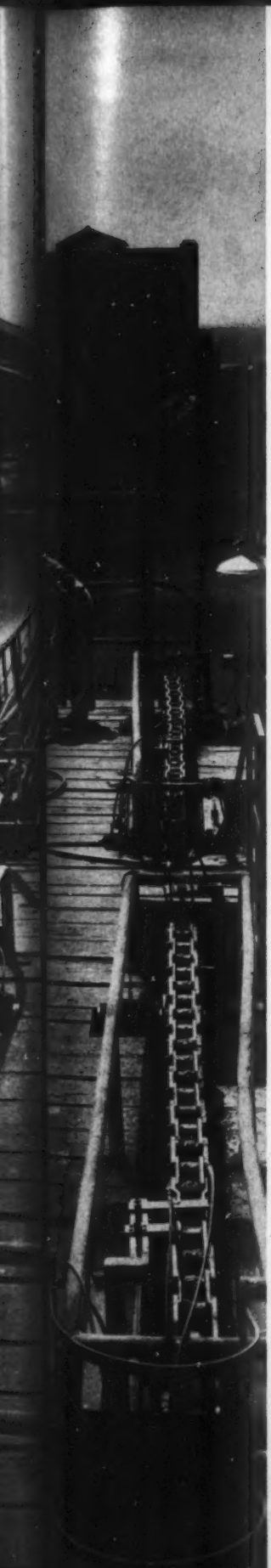


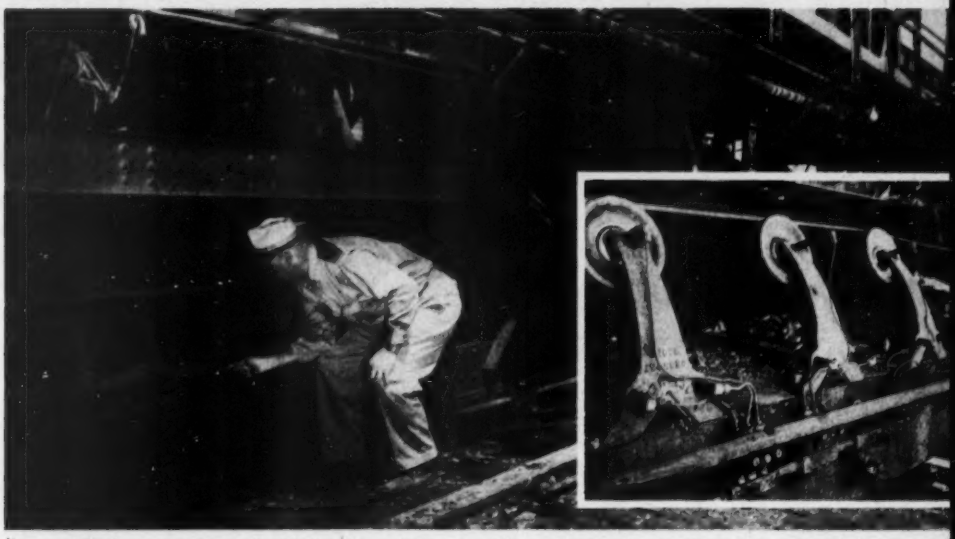
Hand oiling of open gears and chain-sprocket drives—a hazardous, materials-wasting method—is eliminated by the Lincoln system in St. Joe's wood yard. The clusters of injectors receive lubricant from supply line and measure it out through feeder tubes to conveyors that carry material to barking drums.

Paper laminating unit with rewinder has 200 lubrication points, all now taken care of automatically. The Lincoln centralized system reaches every moving part, delivers the right amount of lubrication at the right time . . . no over-oiling, no under-oiling, no need to shut down for lubrication.

Central station services two conveyor lines and barking drums. A Power-Master pump fits original lubricant drum. Wall-mounted Centro-Matic control operates unit automatically. Red light glows when pump is operating. Green signal stays on to indicate all controls are working. Alarm sounds if normal operation is interrupted. A similar pump and time-cycling mechanism serve laminating machine in box plant.







Log and bark conveyors at the St. Joe Paper Company ride on giant roller bearings, being inspected here. All bearings, drive chains, sprockets and open gears in the wood yard are lubricated by the Lincoln centralized system. (Inset) Closeup shows conveyor roller bearing unit under barking drum. Lincoln supply line at bottom feeds the injectors that measure exact amount of lubricant to each roller. Because Lincoln's "one-line" system carries both the lubricant and the pressure, installation and maintenance are greatly simplified.

MILL-WIDE CONVERSION TO LINCOLN CENTRALIZED LUBRICATION CUTS COSTS FOR ST. JOE PAPER CO.

"Lubrication costs must be reduced," demanded a cost analysis report at St. Joe Paper Company, Port St. Joe, Florida. More than 1,000 pieces of equipment with almost 5,000 components requiring lubrication were being serviced manually by oiler crews.

A field engineer from a major oil company was called in to re-survey the mill's requirements. His recommendations reduced the number of lubricant types by 33%. Then Lincoln Engineering Company's specialists were asked to provide the lubricant application systems best suited to St. Joe's needs.

Lincoln centralized automatic lubrication was installed on log-barking drums, conveyors and the shaker screen in the wood yard, and on the laminating machine and rewinder in the box plant. Twelve fork and clamp-lift trucks, one payloader and numerous dump and yard trucks were equipped with Lincoln's Multi-Luber*, a semi-automatic device.

Early in 1960, one year after completion of the installation, Management Engineer Herbert J. Brouillette reported: "The system specifically adapted to our equipment by Lincoln has worked so well that its original cost should be amortized within a very short time. It plays a major role in our mill-wide cost reduction program—has helped us bring lubrication costs back to a realistic level, cut material consumption by as much as 50%, and saved us approximately 240 man-hours of labor every week. We get more efficient lubrication and greatly reduced downtime in the bargain."

For detailed information on Lincoln centralized lubrication and the part it can play in lowering your production costs, write for Catalog 81 and Lincoln's new brochure, "A Report to Management," showing case histories.

LINCOLN ST. LOUIS

LINCOLN ENGINEERING COMPANY

DIVISION OF THE McNEIL MACHINE & ENGINEERING CO., 4010 GOODFELLOW BLVD., ST. LOUIS 20, MO.

*Registered Trademark

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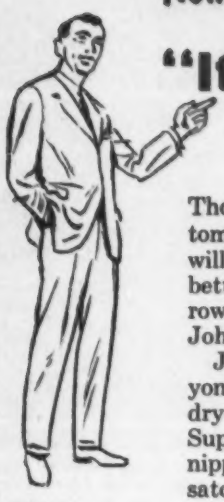
New Paper Machine? Here's a tip from the field:



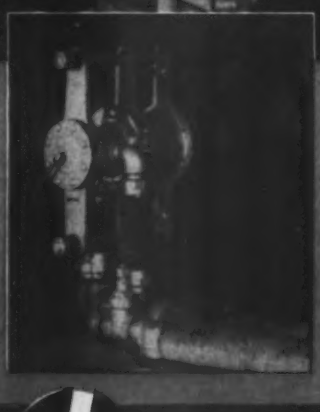
"It's not really new without JOHNSON JOINTS"

Those aren't our words; one of our customer-friends said it. But this much we will say: Any new paper machine will be better able to meet today's—and tomorrow's—demands if it is equipped with Johnson Rotary Pressure Joints.

Johnson engineering has gone far beyond the simple task of getting steam into dryer rolls. Developments like the new Super construction, the "Quick Release" nipple and the Automatic Load Compensator have blazed a trail toward higher operating speeds and pressures. Research with the new Johnson Rotary Syphon places us now on the threshold of a major breakthrough in roll drainage.

Johnson Joints are available for all paper machines—rotating or stationary syphon pipes, open or enclosed gearing. All machinery manufacturers can supply them. We'll supply a pair for 90-day trial in your own mill, so you can get all the facts first hand.

Write for information on Johnson Joints—most advanced and most complete line of its kind



These two are really NEW

Pictures show Johnson Joints on two outstanding paper machines built by Black-Clawson Company, Paper Machine Division. There are 64 Johnson Joints on one, 69 on the other. These are Type L-N Joints, for rotating syphon pipe application. The simple method of mounting employs support rods which carry all the weight of joint and piping, permit the rotating assembly to "float" freely inside. Installations include Automatic Load Compensators, a device which utilizes pressure from within the joint to create a never-varying unloading pressure at the sealing surface, thus cutting power demand and wear to a minimum.

JC

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The magic of our ingredients makes electric motors better...

Just as a good chef wouldn't use only one all-purpose spice to make a specialty...we don't make an electric motor with one all-purpose insulation.

We build motors with SELECTIVE INSULATIONS...

SELECTIVE INSULATIONS are the magic ingredients that make the difference between merely good motors—and the famous dependability, low maintenance, uninterrupted productivity, and prolonged service of Fairbanks-Morse electric motors.

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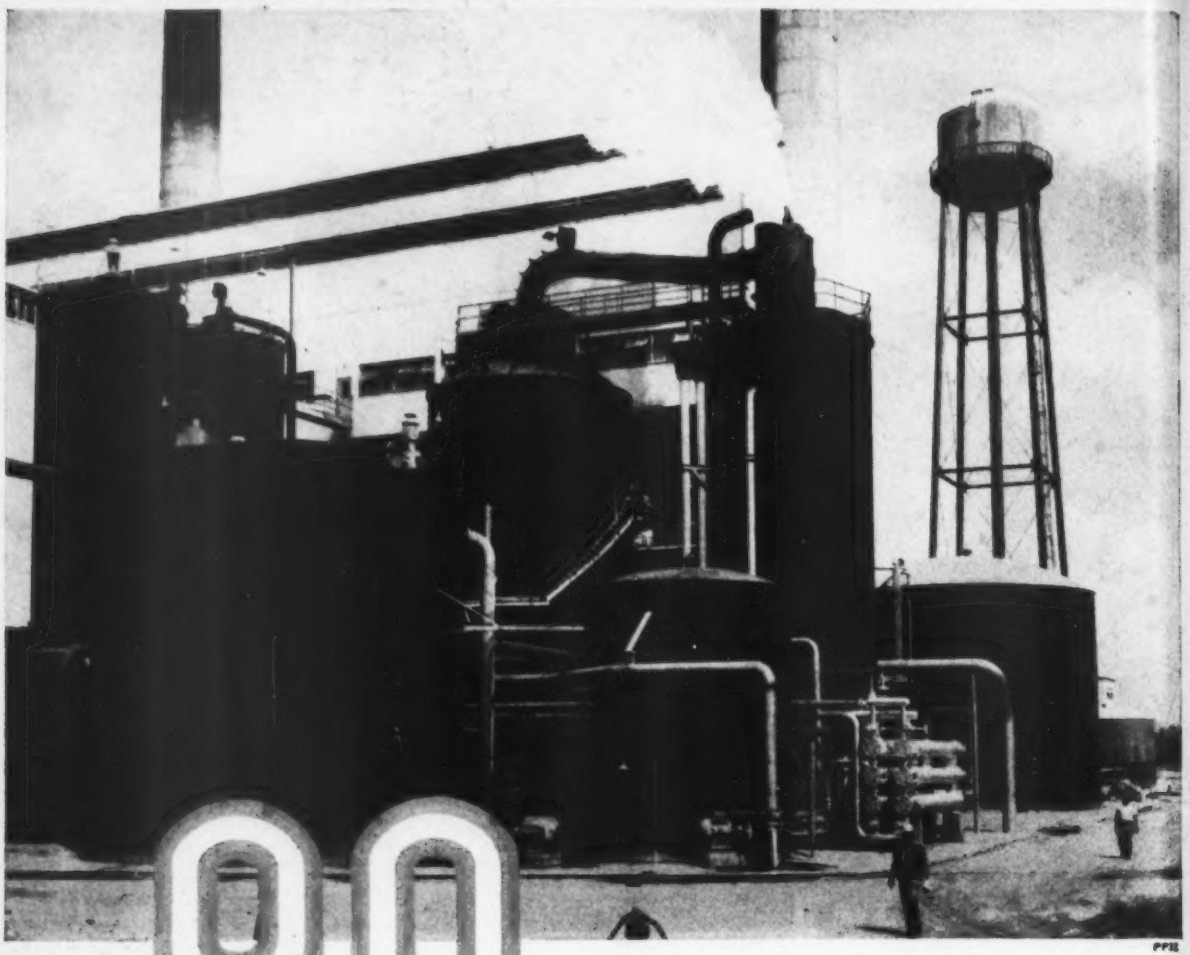

80 CB&I-built structures serve Rayonier in Georgia

Providing chemical wood cellulose is the principal job of two identical chemical mills that form the Jesup, Georgia division of Rayonier Inc. The adjacent plants can work as a unit on the same product or each can be operated independently on different products.

Rayonier's working equipment at Jesup includes more than 80 structures built by CB&I. Among them are a six-body sextuple effect stainless Horton-clad® black liquor evaporator, a 100,000 gallon elevated tank for water storage, several processing towers and a large number of storage tanks.

A bulletin describing CB&I's *coordinated services* and complete range of top-quality equipment for the paper and pulp mill industry is available. May we send you a copy?

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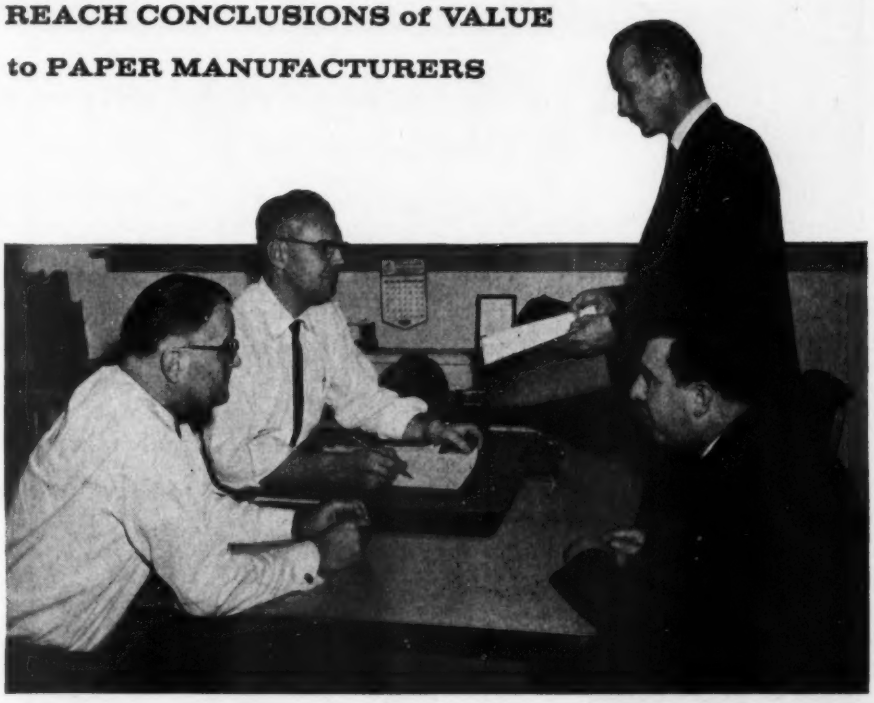
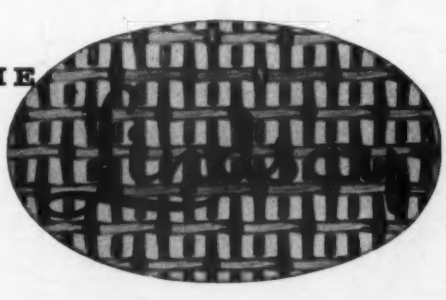


Left to right—Hugh Quinn and Cass Cook, Technical Services; Keith Forbes (standing) and George Wennes, Sales Representatives.

Lindsay sales representatives have frequent occasion to meet with members of the Lindsay Technical Services Division in Cleveland. *Purpose:* to discuss real conditions and find practical answers to problems which arise in the plants of paper manufacturers.

THE



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Some call on you directly . . . others write . . . or phone . . . all are dedicated to one principle . . . to be AT YOUR SERVICE.

How many do you recognize?

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   Vice President – Sales
2. WAYNE DAVIS
   Vice President – Felt Sales
3. JIM SMITH
   Sales Manager

SALES-SERVICE

4. BILL LARKIN
5. TOM TIETZ
6. JOHN WIEGNER
7. RAY PARKER
8. JOE ARMSTRONG

SALES DISTRICT MANAGERS

9. BILL SCHAFFNER
10. CLIFF VAN BUREN
11. JOE TANNER

SALES ENGINEERS

12. LOWELL BROWN
13. CHARLIE PAGE
14. BOB SPELLMAN
15. TOM BURKE
16. LARRY LANE
17. EDMUND PACA
18. RAY DUSTRUDE
19. ED DEWAN
20. WAYNE HARWOOD
21. WALT WILLETTS
22. FRANK McGRATH
23. DICK DANDO
24. BRUCE OWRE
25. ED LYON
26. LARRY WOODSIDE
    Chief Engineer,
    Technical Field Service

SERVICE ENGINEERS

27. GEORGE MARSANKIS
28. BILL SHIRES
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	APPLICATION			CLASS			
	Beater	Calender	Coating	Basic	Acid	Direct	Pigment
YELLOW							
Auramine	•	•		•			
Brilliant Pure Yellow	•				•		
Chinoline Yellow	•	•	•		•		
Chrome Yellow	•		•				•
Chrysophenine	•					•	
Direct Yellows	•		•			•	
Fast Light Yellow		•	•		•		
Fastusol® Yellows	•		•			•	
Hansa® Yellow	•		•				•
Metanil Yellow	•	•			•		
Oxide Yellow	•		•				•
Paper Yellow	•					•	
Permagen® Yellow	•		•				•
Stilbene Yellows	•					•	
Tartrazine		•			•		
ORANGE							
Acid Orange	•	•	•		•		
Benzo Fast Oranges	•		•			•	
Chrysoidines	•			•			
Direct Fast Oranges	•		•			•	
Fast Light Orange		•			•		
Fastusol Oranges	•		•			•	
Orange	•	•	•		•		
Permanent Orange	•		•				•
Paper Orange	•					•	
BROWN							
Benzo Brown	•					•	
Bismarck Browns	•		•	•			
Fastusol Browns	•		•			•	
RED							
Benzo Bordeaux	•					•	
Benzo Fast Scarlets	•		•			•	
Benzo Rhoduline® Red	•		•			•	
Brilliant Croceine	•	•	•		•		
Direct Pink	•					•	
Direct Reds	•					•	
Fast Red	•				•		
Fastusol Pink	•		•			•	
Fastusol Reds	•		•			•	
Fastusol Scarlet	•		•			•	
Magenta	•	•	•	•			
Oxide Red	•		•				•
Paper Red	•				•		
Paper Scarlets	•					•	
Permagen Red	•		•				•
Permanent Carmine	•		•				•
Rhodamines	•	•	•	•			
Safranine	•	•	•	•			
Solar® Pink	•		•				•
Solcarbo® Pink	•		•			•	

	APPLICATION			CLASS			
	Beater	Calender	Coating	Basic	Acid	Direct	Pig
VIOLET							
Brilliant Benzo Violet	•					•	
Crystal Violet	•	•		•			
Ethyl Violet	•	•		•			
Fastusol Violets	•					•	
Formyl Violet	•	•			•		
Methyl Violet	•	•		•			
Solar Coating Violet			•				•
Solar Violet	•		•				•
BLUE							
Benzo Azurine	•		•			•	
Benzo Blues	•		•			•	
Benzo Sky Blue	•		•			•	
Brilliant Benzo Blue	•		•			•	
Brilliant Wool Blue		•			•		
Fast Bond® Blues	•				•		
Fastusol Blue	•		•			•	
Fastusol Turquoise Blue	•		•			•	
Heliogen® Blues	•		•				•
Methylene Blue	•	•	•	•			
Neptune® Blues		•	•		•		
Paper Pure Blue	•	•	•	•			
Rhoduline Blues	•	•		•			
Solar Blues	•		•				•
Solar Coating Blue			•				•
Solcarbo Blues	•		•			•	
Soluble Blues	•				•		•
Victoria Blue	•	•	•	•			
Victoria Pure Blue	•	•	•	•			
GREEN							
Benzo Greens	•					•	
Brilliant Green	•	•	•	•			
Fast Bond Green	•				•		
Fastusol Greens	•					•	
Guinea Green	•	•	•		•		
Heliogen Greens	•		•				•
Heliogen Viridines	•		•				•
Naphthol Green		•	•		•		
Neptune Green	•	•	•		•		
Pigment Green	•		•				•
Solar Green	•		•				•
Victoria Green	•	•	•	•			
BLACK							
Acid Black		•			•		
Basic Black	•	•		•			
Diamine Black	•		•			•	
Diazo Black	•		•			•	
Direct Deep Black	•		•			•	
Fastusol Greys	•		•			•	
Naphthylamine Black	•	•	•		•		
Nigrosines	•		•			•	
Permanent Black	•		•				•

Partial list of colors and types available from GDC

GDC, as a major supplier of dyes for the paper industry, offers the newest colors available in the widest variety of forms. In this manner we are able to satisfy all individual requirements. Write direct for complete information and samples or call the GDC service representative nearest you.

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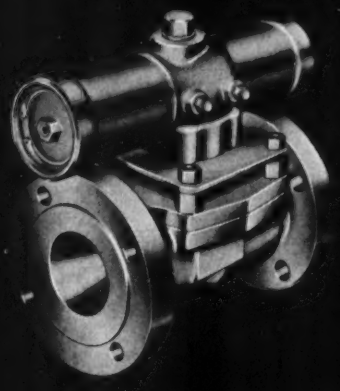
Did a Pulp and Paper Man Design the FLO-BALL Valve?



In a way, yes. Hydromatics' design engineers went to pulp and paper mill men all over the country to find out just what they wanted in a valve. The result is the Flo•Ball, the only valve that answers all the valve problems peculiar to the pulp and paper field. Just check all these special advantages:

- **Low torque—no need to put persuaders on the Flo•Ball handle.**
- **Excellent for high consistency stock.**
- **Straight-through fluid path.**
- **Fast 90° on-off—you can see the Flo•Ball's position.**
- **Lowest leakage of any valve.**
- **Fits into any mill operation facility: pneumatic, hydraulic, electric.**
- **Ideal for groundwood, sulfite or sulfate mills.**
- **A wide variety of metals and elastomers handle chemicals like alum, black liquor, various clays, caustics, bleaches, dyes.**
- **Virtually no downtime, inspection. No special tools required—easy to disassemble and assemble right in the line!**
- **Two-way flow—seals perfectly in both directions.**
- **No lubrication.**
- **One-piece stem and ball—adds strength and precision.**

FLO-BALL

Write today for complete information.

Hydromatics, Inc.

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★ **"Syntho-Cotton"® Dryer Felts**
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★ **"Dacron-Nylon" Dryer Felts**
100% synthetic content.

SCAPA Pioneered and Manufactured
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U.S. Pat. Nos.	2,612,190	2,629,909
U.S. Pat. Nos.	2,879,580	2,882,933
U.S. Ser. Nos.	595,616	604,279

14

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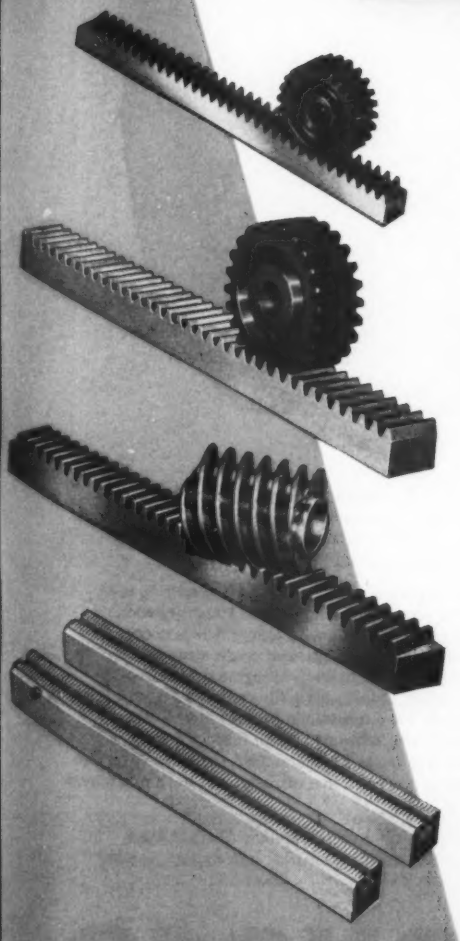
GEAR RACKS



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with quality as a first consideration

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Whatever your requirements are for changing rotary power to linear power depend on ILLINOIS GEAR for racks that are made right with quality as the first consideration.

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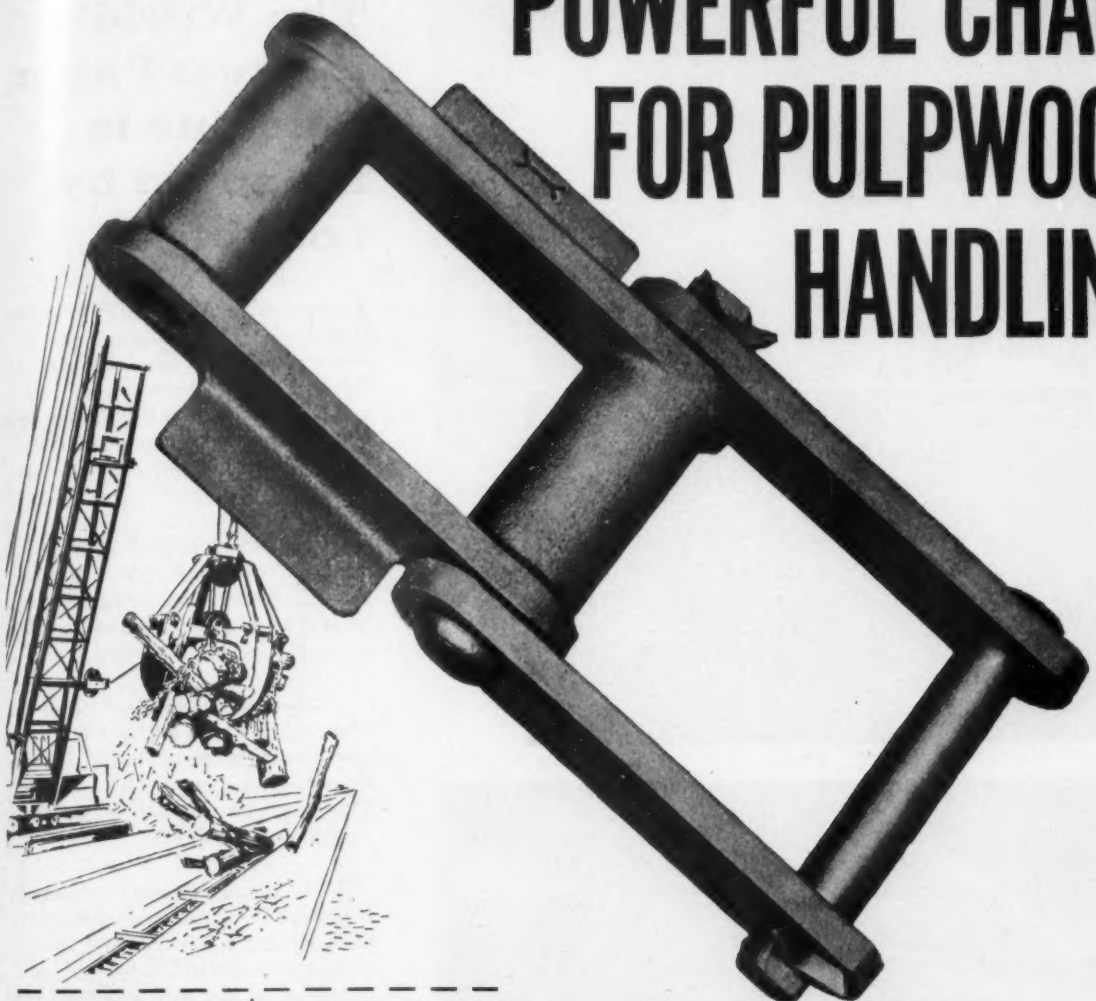
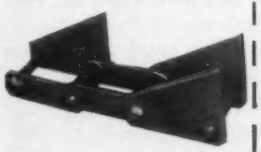
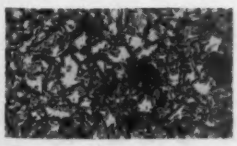
POWERFUL CHAIN FOR PULPWOOD HANDLING

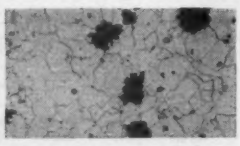




Attachments are available to suit a variety of conveyor applications.

File-hard surfaces of Flint-Rim sprockets help maintain efficient, dependable performance of chain and sprockets . . . prolong chain life.





Promal or file-hard Promal chain can be furnished for unusually abrasive conditions. Dark areas in Promal structures (left) show stronger, stiffer reinforcing material. Malleable (right) shows white "free-iron," black is soft carbon nodules.

Broad sliding surfaces of Link-Belt C-132W chain hold up longer on drag conveyors

Yes, with its broad top and bottom surfaces, Link-Belt C-132W chain is particularly resistant to the sliding wear encountered on carrying and return runs of drag conveyors. This high durability pays off in low maintenance, minimum shutdowns.

C-132W chain combines cast center links with steel sidebars connected by steel pins — offers ample, live joint bearing area to withstand pulpwood punishment. For further facts, contact your nearest Link-Belt office or authorized stock-carrying distributor, listed under CHAINS in the yellow pages of your phone directory. Or write for new Catalog 1050.

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LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scaroboro (Toronto 13); South Africa, Springs. Representatives Throughout the World

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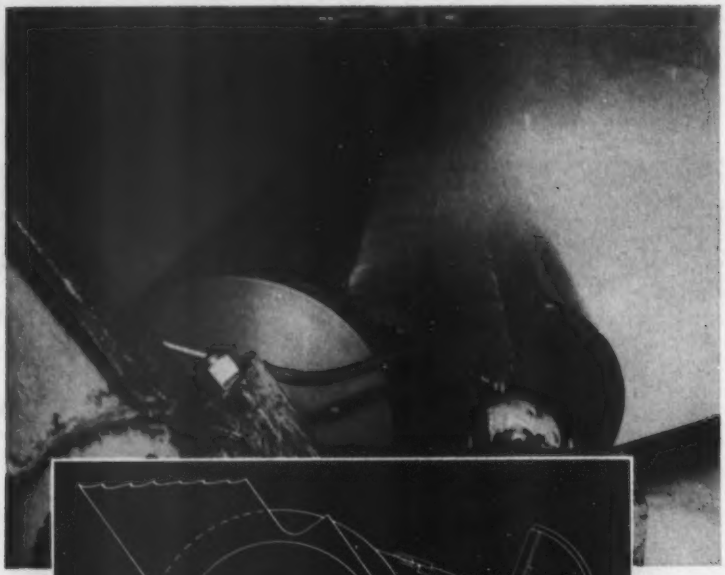

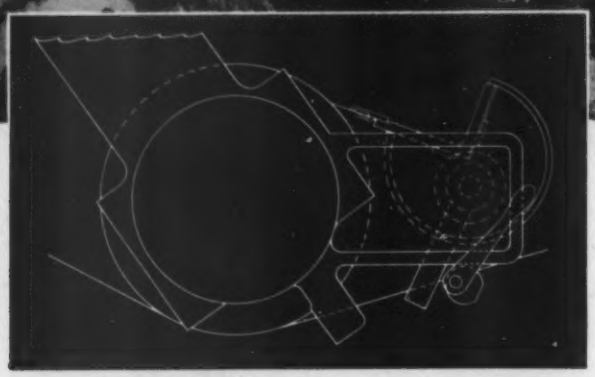

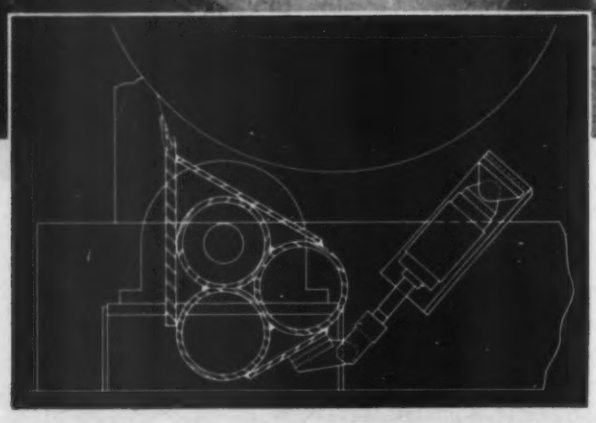

The World's Largest Paper Machine is Doctored by Lodding

PROPER DOCTORING of paper machine rolls results from long experience in specialization. For this there is no substitute. And, as doctors are precision tools, each installation must be custom-engineered and skillfully made. Proper doctoring doesn't just happen. It's planned.

That is why most progressive mills and machine builders come to Lodding for their doctoring needs. That is why Lodding has yet to fail in any doctoring assignment.

When the Great Lakes Paper Company installed a 342-inch newsprint machine at Fort William, Ontario it was doctored by Lodding. This longer face width presented a challenging problem.

The Black-Clawson Company, builders of this machine, turned to Lodding for the solution. With the necessary design modifications, doctors were designed and built that today are providing hydraulically oscillating, uniform blade loading over a 342-inch span.

When you need good doctors for proper roll doctoring, you can rely on Lodding's specialized experience. Satisfaction is guaranteed.

Call, write, or wire for the benefits of this specialized technical service.

LODDING
Engineering Corporation
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leading manufacturer of
wires for KRAFT PAPERS

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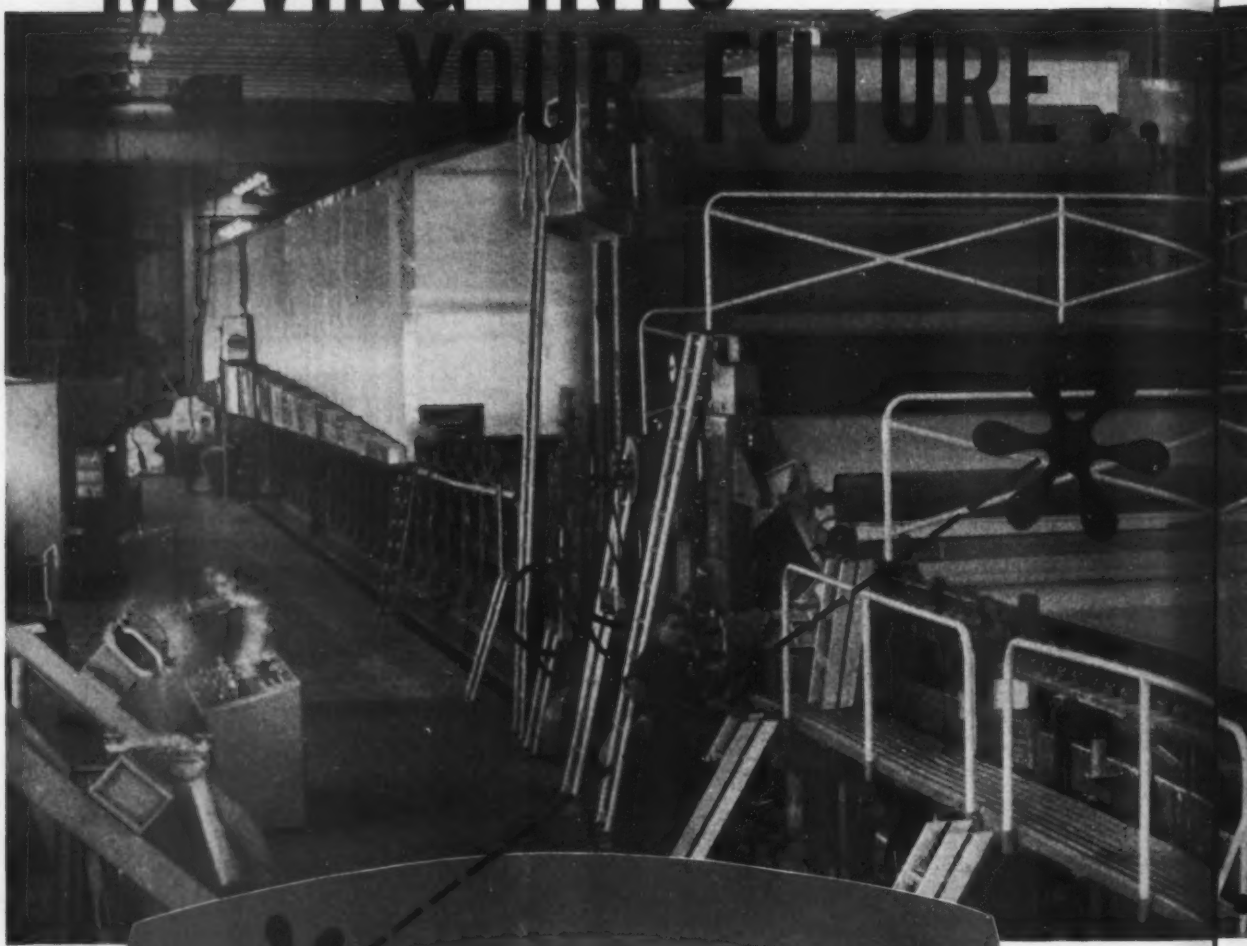

NICOLET PAPER COMPANY'S NEW 160" NO. 3 MACHINE

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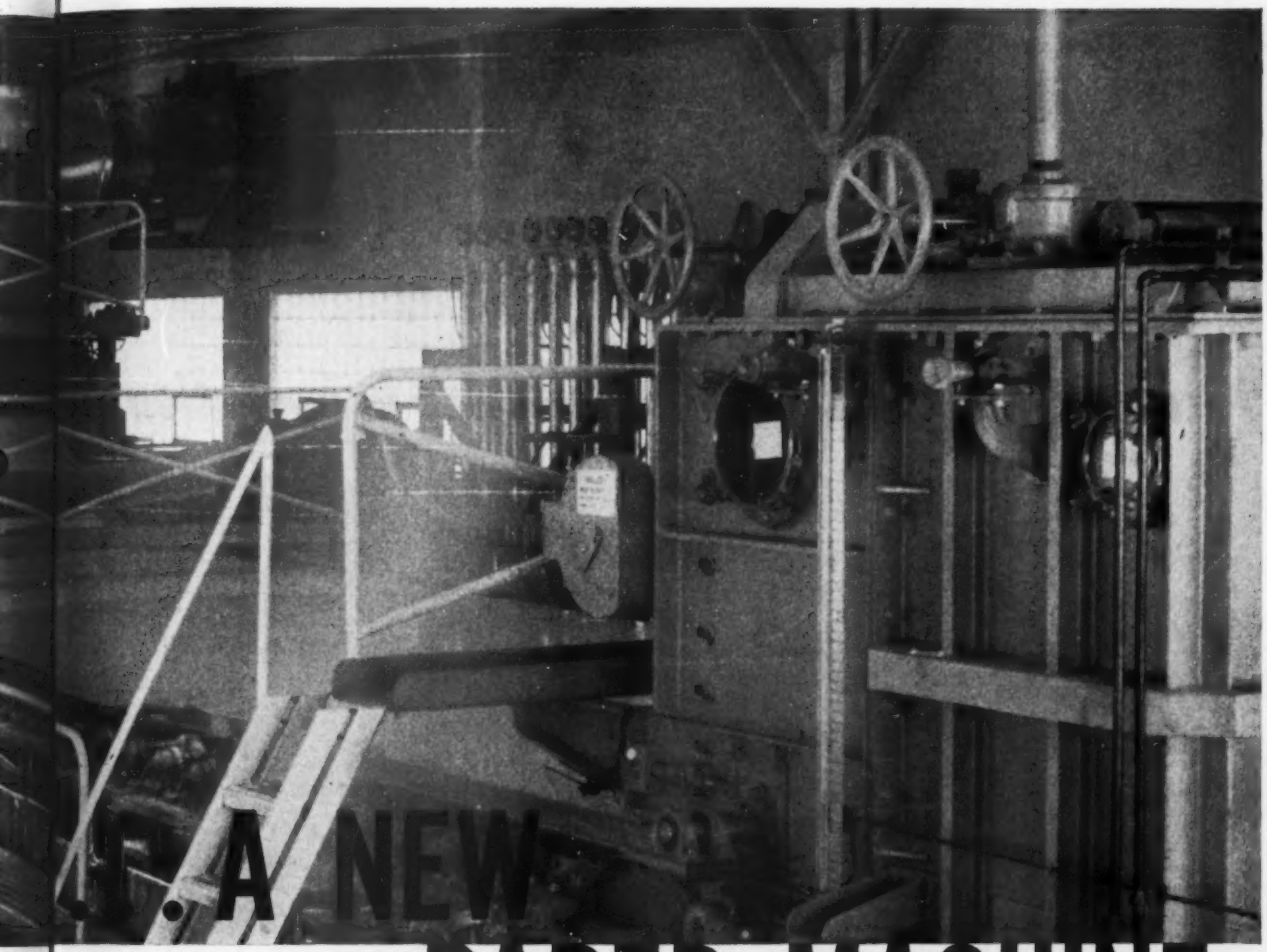

A NEW PAPER MACHINE

by.. VALLEY

VALLEY IRON WORKS CORPORATION
SUBSIDIARY OF ALLIS-CHALMERS MANUFACTURING COMPANY
APPLETON, WISCONSIN
West Coast Representative: E. A. Berry, P.O. Box 958, Longview, Washington
Canadian Representative: Pulp and Paper Mill Association Ltd., P.O. Box 850, Station "O", Montreal 9, Quebec

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Nicolet's new glassine paper machine in operation

Nicolet Paper Corp.'s latest expansion includes a Valley Iron Works Corp. 160-in. wide paper machine, three E. D. Jones beaters, two E. D. Jones Hi-Lo pulpers, an Overly "Air Curtain" hood, a Cameron Duplex winder, and an Appleton Machine 16-roll, 600-hp supercalender.

IN APRIL, 1960, Nicolet Paper Corp. began production on its new 160-in. wide paper machine designed to produce glassine and grease-proof paper grades. The machine marks Valley Iron Works entry into the complete paper machine manufacturing field. The new machine enabled the Company to double its capacity and thereby make Nicolet the third largest producer of glassine paper. It is also of interest to note that Nicolet holds the patent for the use of urea and nitrate as a plasticizer for glassine papers which has now largely replaced the use of glycerine for this purpose.

Other highlights of Nicolet Paper's completed expansion program include: two Hi-Lo pulpers of 2500-lb. capacity each; three No. 2, 2500-lb. capacity beaters equipped with air-loaded, instrument-controlled cylinders; the Air-Curtain design of the machine hood which is the first of its kind installed on a paper machine; a Model 680 duplex winder believed to be the world's largest winder; and the 1500 fpm, 147-in.-face, 16-roll supercalender driven by a 600-hp dc motor.

All equipment was designed and installed by Nicolet's engineering department in cooperation with the equipment manufacturers.

Stock preparation

The installation of the new paper machine also necessitated the addition of a new stock preparation system since the machines may be required to produce different grades of glassine. Baled sulfite and sulfate pulp and broke are pulped in two 2,500-lb. capacity Hi-Lo pulpers which permit complete defibering of pulp at 6½ per cent consistency. Broke from certain treated glassine as well as wet strength broke is pretreated in a Slush Maker prior to pulping in the Hi-Lo pulpers.

The pulped stock is then pumped at 6½ per cent consistency to the three new No. 2 beaters of 2500-lb. capacity each. Each beater has a lava stone filled 22-ton roll and three lava stone bed plates to achieve maximum hydration and minimum cutting of fibers. The effective weight of the roll can be controlled by an instrument and an air-loaded cylinder from 0-44 tons. A cam governs both this load and the time of beating. Each beater is driven by a 300-hp motor. All equipment and piping is of stainless steel construction.

From the beaters, stock drops to a beater chest of tile construction and is then pumped to the machine chest. It then goes through a Type II/6 consistency regulator to two Accru-set equipped Majestic jordans — one, driven by a 400-hp motor, has a bronze filling while the other, driven by a 125-hp motor, has a lava filling. The jordaned stock goes to a small tile-lined machine chest.

The remaining dirt and suspended air are removed in a Vor-Vac system. The stock is then pumped by a 6250-gpm fan pump through two Size 24 P selectifier screens to the machine headbox. Another Type II/6 consistency regulator is located in the stock system just ahead of the fan pump.

The paper machine

The accepted stock flows into a dual tapered, stainless steel manifold with eight entry ports leading into the first of the three passes in the headbox. The headbox is designed with two stainless steel distributing rolls. An air motor-operated, adjustable baffle controls the velocity of the stock flow into the inlet pond. A fully adjustable inlet, or slice, is attached to the headbox and incorporates an adjustable apron, front plate and regulating plate to control the slurry flow onto the wire for all speeds and grades. A patented profile bar, or scraper lip, is attached to the delivery edge of the up-

per nozzle, or slice, lip. The air pad for either vacuum or pressure operation is maintained through the patented flow controller maintaining the desired liquid level as well as total operating head under all speed conditions for the wide range in which this equipment is to operate.

The right-hand paper machine is designed with a cantilevered fourdrinier operating with a 160-in. wide by 96-ft. long wire. The fourdrinier is equipped with two dead rails extending from the breast roll to the couch and three cantilevered beams supporting the entire fourdrinier section. The dead rails and beams are shrouded in stainless steel. A centrifugally cast bronze breast roll is mounted on the upstream cantilevered beam and is raised and lowered for wire changes through an air motor and reducer. The forming table consists of split shake rails on both the tending and drive side supported on Micarta springs. The level fourdrinier table is equipped with twin shake units. The forming table has a multiple strip forming board, rubber-covered table rolls operating in adjustable, anti-friction bearings and deflectors placed between the table rolls at the upstream end of the fourdrinier. Vacuum of the oscillating, stainless steel suction boxes is controlled through a Broughton system. The 36-in. dia. suction couch is attached to the third cantilevered beam eliminating the necessity for dismantling the suction connection during wire changes. A 32-in. dia. turning roll completes the wire run.

Six rubber-covered wire rolls are placed in the wire return run. The return run includes one automatic take-up, one automatic stretch roll and one automatic guide roll. Each of the wire return rolls is equipped with a doctor blade as well as the breast roll and turning roll. A fourth roll is equipped with a hand guide and the other two rolls are plain. A shower is placed over each wire return roll. There is also a knock-off shower just upstream of the turning roll.

A unique wire changing rig has been incorporated into the design of the fourdrinier section. The wire bundle and poles are placed in the couch carriage which includes an under carriage. The breast roll carriage is placed in position and the wire loop is secured by poles in this carriage. The couch carriage (together with the under carriage, moving in tracks along the tending side aisle) is manually drawn toward the couch and turning roll. After the wire has been paid out and all the wire poles placed in position, the wire stringing device is pulled into the fourdrinier; the couch carriage rolling on the tracks provided with the under carriage arrangement. This design avoids tying up the crane during wire changes.

A Teflon-coated, driven blow roll guides the sheet from the bare wire between the couch and returning roll to the felt roll of the first press. The press section consists of a suction first press of conventional design, a second press which operates as an air bleed unit, a plain, inclined, reverse press in the third position followed by a plasticizer press. The plasticizer press designed with a special knurled kissing roll applies plasticizing material to increase the paper toughness with less tendency toward brittleness. The presses are designed with a gibbed way couching arrangement operated through a screw and sliding base. The loading of the presses is done through an air-hydraulic system operating on mill air pressure.

Vacuum in the suction boxes, couch and suction presses is provided by three vacuum pumps, two of which are driven by 150-hp and one by a 100-hp thermolastic-insulated motors.

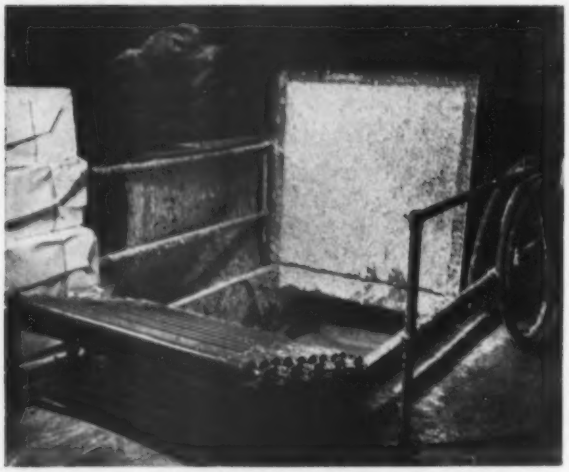
Automatic recycling felt tension devices are incorporated in the felt stretchers. The felt stretchers also include an air-operated seam straightener. The felt runs in each of the first three presses include automatic air guides, hand guides and felt conditioners. The rope carrier system begins just downstream of the second press and carries the tail through the third press and the plasticizer and on through the first two sections of dryers to a manual transfer point at the size press. The second section of rope carriers takes the tail from the upstream side of the size press to just ahead of the machine calender. An air chute carries the tail into the machine calender and a rope system at the reel guides the tail through the reel.

The dryer section of the machine consists of a main and after dryer section. The main dryers are split into two sections with an automatic rope transfer. All of the dryers on this machine were designed and constructed

Arthur Snapper
President

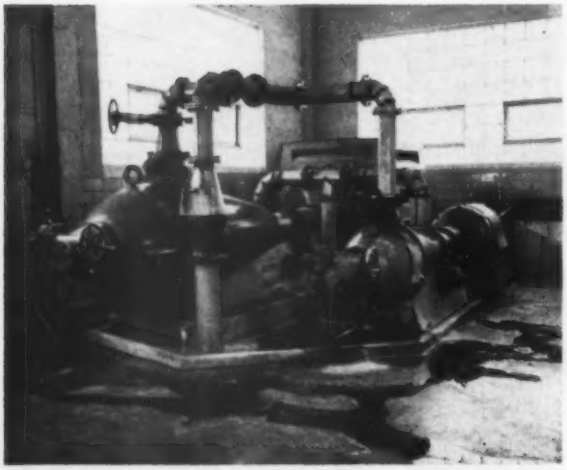
Henry Fowler
Vice-President & General Mgr.

Herbert Wenberg
Mill Manager

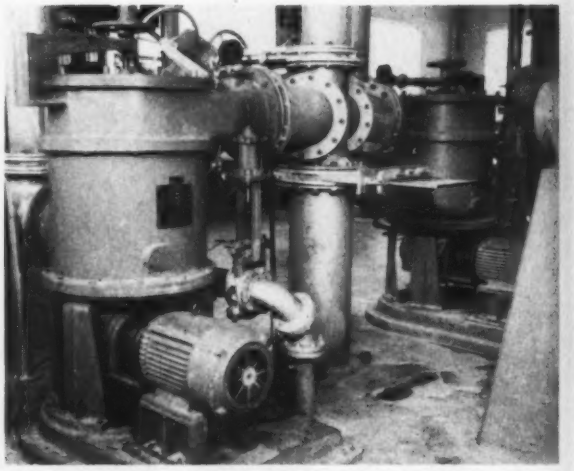


E. D. Jones Corp. Hi-Lo pulpers of 2,500-lb. capacity.

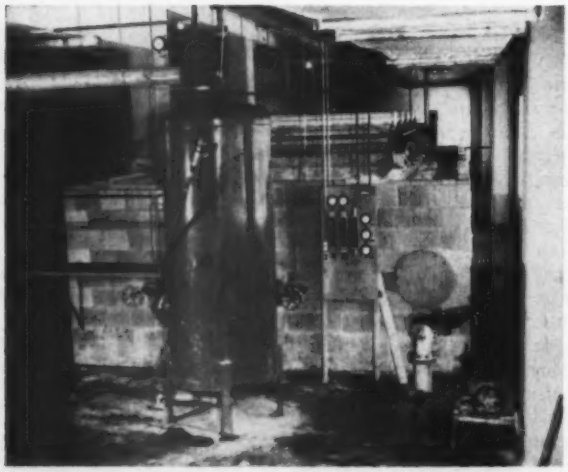
E. D. Jones, 2,500-lb. capacity beaters with lava-filled rolls.



E. D. Jones Corp. Majestic jordans with Accru-Set controls.



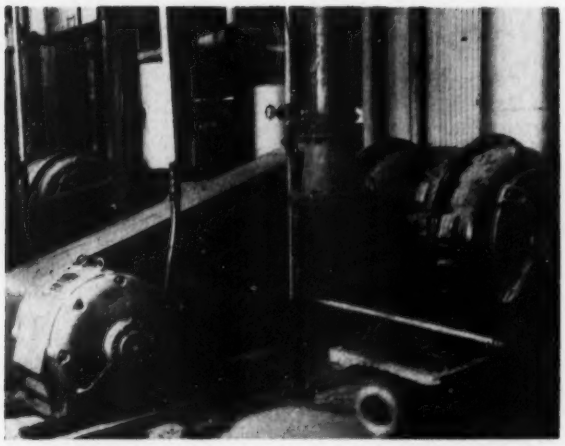
Black-Clawson Corp. Size 24-P selectifier screens.



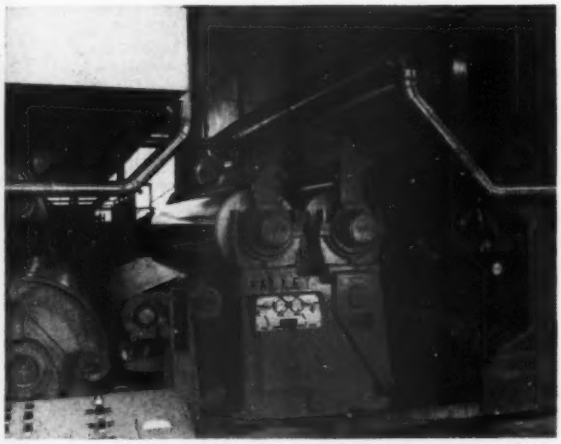
Sveen-Pedersen 700 gpm capacity save-all.

Warren Pumps 6,250 gpm fan pump.

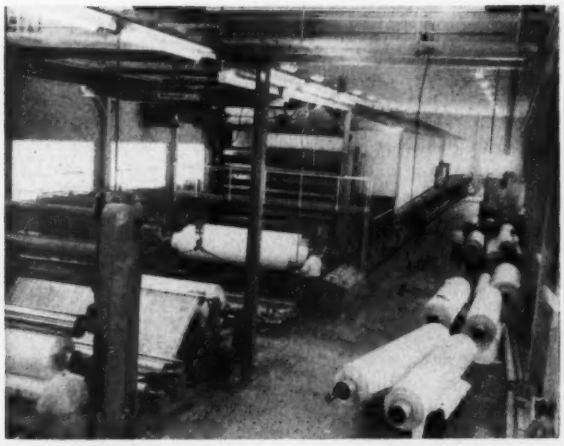
Wet end of Valley Iron Works machine showing press section and Overly hood over dryer section.



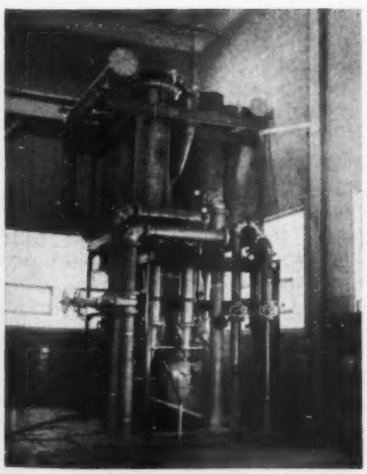
Vacuum is supplied by Nash Engineering vacuum pumps driven by 150-hp and 100-hp Westinghouse motors.



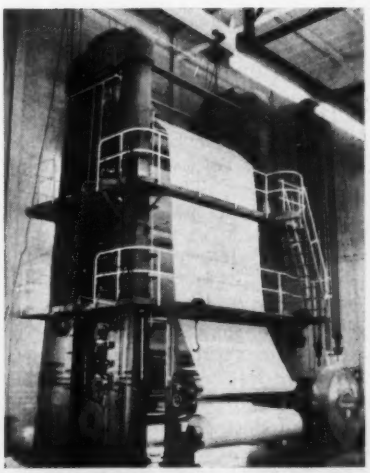
Valley Iron Works horizontal size press with 38-in. dia. rubber-covered rolls.



Valley Iron Works dryer section, 8-roll calender stack and Cameron winder.



Nichols Engineering Vor-Vac system for final cleaning of paper stock.



Appleton Machine Co. 16-roll supercalender driven by a 600-hp motor.

N. Jansen, tech. director; J. Hyatt, asst. superintendent; C. Armstrong, superintendent of No. 3 machine.

with alloy cast iron shells and heads for operating steam pressures up to 75 psi. The first section of fourteen, 48-in. dia. by 160-in. face paper dryers also includes two felt and four Feeney dryers. The second section is designed with 14 paper dryers and two felts and two Feeneys. The after dryer section has 14 paper dryers and two felt dryers. Box section, cast iron framing is used on the tending side. The drive side framing consists of the enclosed gear housings. The enclosed, continuously lubricated, helically cut, ductile iron gears and idlers are mounted in heavy spherical roller bearings. All idler gears are straddle bearing mounted in removable cartridges. The dryer felts run over felt rolls mounted in antifriction bearings and each run includes an automatic stretcher and an automatic air guide.

Inspection windows are provided at the nips of the gears and also on the tending side bearing housings. All dryers are equipped with the latest style quick-release steam joints and rotating syphons. Oscillating doctors are used in all dryer sections. Ready access to the dryers is possible on aluminum ladders which travel on rails running the full length of the section, and these units may be locked in position. Drive side access to the dryers is made possible through an elevated walk extending the full length of the sections. The first two after dryers are coated with Teflon in order to prevent buildup of size from the horizontal size press.

A 60-gpm continuous oiling system is designed to lubricate all of the tending and drive side dryer bearings, the drive side felt roll bearings and all of the gears in the enclosed cases. The system includes a precipitation tank and cartridge-type pressure filters. System oil temperature is controlled and maintained by a cooler. Pressure and flow of oil is positively kept with one of the two pumps. If the oil pressure drops, an alarm sounds and the second pump is automatically started through an interlocking relay.

The dryer drainage system — a blow-through flash system utilizing a pressure drop between sections for condensate evacuation — features a pressure differential unit on each dryer insuring complete condensate removal. The main valve is controlled through a direct reading from the dryer condensate. Effective control of the moisture content is obtained and the system minimizes edge-curl and over-drying.

The horizontal size press following the second section of the main dryers is designed with two, 28-in. dia., rubber-covered press rolls. The sheet passes over a brass lead-in roll into the nip of the size press where the size is supplied to either one or both sides of the sheet through stainless steel headers and equally spaced discharge nozzles. This design makes it possible to operate without a size tub and permits greater control of sizing penetration on either side of the sheet. A simple interlock shuts off the flow of size when the press is unloaded with the rolls still in contact. The loading of the size press is similar to the main presses, that is, an air-hydraulic arrangement operating on the dead end load principle. The press opens and closes with controlled air pressure applied in an accumulator, thus moving the oil into the hydraulic cylinders. High and controlled nip pressures are obtained through the use of a hydraulic booster arrangement from reduced air pressure from the mill supply. This arrangement eliminates the necessity for large oil reservoirs and hydraulic pumping equipment. An independently regulated nip pressure can be obtained at each end of the press. In addition to the main size press drive, a helper drive is incorporated to apply torque to the pivoted roll. The size press is followed by a cast-bronze centrifugally driven turning roll and a fixed expander roll leading into the two Teflon-covered dryers described previously in the after dryer section.

The sheet leaves the after dryer section under a pneumatic rubber tire mounted spring roll into the calender stack designed for nip pressures up to 600 pli. The sheet is conveyed by automatic air transfer into the eight-roll stack. An infinitely adjustable expander bar spreads the sheet into the first nip. The "A" frame calender is complete with a full complement of doctors and continuous lubrication for the anti-friction bearings through the main lubrication system in the dryer section. An electric lift arrangement raises the bored intermediate and queen roll. The loading on the stack is accomplished through an air-hydraulic reciprocating booster arrangement.

The calender is followed by the latest designed horizontal track reel arranged for both surface and center wind operation. The reel is equipped with a 36-in. dia. by 160-in. face, cast-iron drum and can build mill rolls up to 55 in. dia. The 12⅝-in. dia. reel spools are placed in the primary arms when they are in the upright position to support the reel spools out of contact with the drum in preparation for transfer of the paper from one spool to the other. When the sheet is ready for transfer, the primary arms move the spool off the stationary cams. The reel spool drum contacts a driven reel spool starter to bring the spool up to drum speed. The primary arms are lowered through an anti-torque type cross shaft and linkage system and are air-cylinder operated. Once the primary arms are lowered to the horizontal position and the secondary arms are advanced to pick up the reel spool controlling the tightness of the reel buildup, the entire recycling operation is automatic and the primary arms retract into the vertical position, ready to receive the next reel spool. The reel is designed to manually eject a spool with any amount of paper buildup when a new start is desired.

The unique center wind reel attachment is driven through a synchronized clutch half designed to engage with the previously mentioned reel spool drum. A center wind drive is part of the helper drive system incorporated in the machine drive. The drive operating through a slip belt and special knuckle joint arrangement controls the tension in the roll buildup from the spool to the full 55-in. mill roll size.

The winder

The Model 680 winder installed at this mill is the world's largest duplex winder. It has a 50-in. dia. rewind capacity and a maximum operating speed of 2000 fpm. The winder uses the differential rewinding principle allowing each rewinding roll to set its own peripheral speed — a principle not previously used on large paper roll winders.

The winder is equipped with a pneumatically actuated device to automatically counterbalance the rewinding rolls. Nip pressure between the rewinding rolls and the main pull roll can be regulated to achieve with unequalled precision, the desired density of the finished rolls.

Also serving the new machine is a 150-in. trim width, Model 460 two-drum winder. It has a rewind capacity of 60-in. dia. and a maximum operating speed of 3000 fpm. It has score-cut slitting elements equipped with a rack and pinion lateral adjusting device for speed and precision in setting up the desired width of strip.

The winder is further equipped with hydraulically operated riding roll and rewind shaft bearing lift mechanisms to minimize down-time between sets. It has a roll ejector working in conjunction with a roll lowering table which has a built-in scale to weigh the finished rolls. An automatic shaft puller removes the rewind shafts and inserts them in the new cores.

The Model 460 winder is driven by a 60-hp main drive motor, direct connected to an isolated gear box equipped with straddle mounted gears and forced feed lubrication system.

The unwind equipment used with the Model 460 winder has a continu-

ous, water-cooled drum brake designed to obtain maximum power capacity.

The supercalender

The 33-ft. high, 147-in. face, 16-roll, 1500-fpm supercalender is claimed to be the largest in operation. It has a 46-in. dia. bottom roll and a 38-in. dia. top roll and develops a maximum nip pressure of 4000 lb. pli.

The supercalender, equipped with automatic control of wind-up tension through slip belt drive and automatic mechanical unwind tension control, is driven by a 600-hp dc motor controlled by Magamp regulators.

drinier, size press and reel are augmented with a helper drive arrangement. A number of dc generators are belt driven from the lineshaft. The suction couch roll, pivoted size press roll and reel center wind drive complete the helper drive arrangement. An interlock system controls the torque applied to the helper driven elements.

Six instrument consoles located on the tending side of the machine control the various components beginning at the headbox and extending to the winder. The consoles are compartmented for the electrical controls and wiring as well as the air controls. All

exhaust; (6) the wet end supply system; (7) the dry end supply system; and (8) the roof exhaust.

The roof and side panels of the hood are made of a 3-in. styrofoam insulation sandwiched between aluminum panels.

The hood has a continuous plenum exhaust formed by a distributing baffle placed within the hood to provide an evenly distributed exhaust pattern.

The "air curtain" supply air equipment, located in the basement, consists of a dampering, filtering, preheat and reheat coil section, and a fan which

Principal equipment installed at Nicolet Paper Corp.'s mill

Consulting Engineers — Pfeifer and Shultz

Stock preparation and handling

Beaters (3), No. 2, 2500-lb. capacity, equipped with lava-filled rolls and bed plates and driven by 300 hp motors	E. D. Jones Corp.
Consistency regulators, Type II/6	Krofta Engineering Corp.
Fan pump, 6250 gpm, driven by 125-hp motor	Warren Pumps, Inc.
Hi-Lo pulpers (2), 2,500-lb. capacity	E. D. Jones Corp.
Instrumentation, pressure control and beater roll loading	Foxboro Co.
Jordans (2), Majestic, Accru-set equipped, driven by 400-hp and 125-hp motors	E. D. Jones Corp.
Motors	Westinghouse Electric Corp.
Selectifier screens (2), Size 24P	Black-Clawson Co.
Stainless steel piping	Nicolet Paper Corp.
Slush-Maker	Morden Machines Co.
Tile linings	Chemical Linings Inc.
Vor-Vac system	Nichols Engineering & Research Corp.

The paper machine and auxiliary equipment

Air system, featuring "Air-Curtain" hood	Overly's Inc.
Airflex clutches	Farwick Airflex Div.
Airguide rolls (10)	Gilbert & Nash Div.
Bearings	Timken Roller Bearing Co., SKF Torrington Co.
Calender stack, 8-roll	Farrel-Birmingham Co. Inc.
Couch roll, suction, 36-in. dia.	Beloit Iron Works
Dryer section, consisting of 42 paper dryers, 6 felt dryers, and 6 Feeneys — all 48-in. dia.	Valley Iron Works Corp.
Dryer drainage system, Cram system	Appleton Machine Co.
Expander roll	Mount Hope Machine Co.
Felt conditioners	Bird Machine Co.
Fourdrinier cantilevered, equipped with 160-in. wide wire, stainless steel suction boxes, and 36-in. dia. couch	Valley Iron Works Corp.
Gear reducers on paper machine drive	Falk Corp.
Head box, 3-pass, air-loaded, stainless steel-lined	Valley Iron Works Corp.
Helper drives and generators	Westinghouse Electric Corp.
Lubrication system, 3600-gal. cap., circulating, with precipitation tank and cartridge filters	Bowser Inc.
Motors, electric	Westinghouse Electric Corp.
Press section, suction 1st press; 2nd press operating as an air-bleed unit; a plain, inclined, reverse 3rd press; and a plasticizer press	Valley Iron Works Corp.
Reel, with 36-in. dia. drum and twelve ⅜-in. dia. spools	Valley Iron Works Corp.
Rubber covering on rolls	Stowe-Woodward Inc.
Save-all, 700-gpm capacity	Sveen Pedersen Sales Corp.
Showers	A. E. Broughton & Co.
Size press, horizontal, with 38-in. dia., rubber-covered rolls	Valley Iron Works Corp.
Steam joints, quick-release type, and syphons	Johnson Corp.
Steam turbine, on lineshaft drive	De Laval Steam Turbine Co.
Suction box vacuum control	A. E. Broughton & Co.
Suction press rolls	Beloit Iron Works
Supercalender, 16-roll, with 46-in. dia. bottom roll, and 38-in. dia. top roll, driven by 600-hp motor	Appleton Machine Co.
Tile linings	Chemical Linings Inc.
Vacuum pumps (3)	Nash Engineering Corp.
Winder, Model 680, 2000-fpm, using differential rewinding principle	Cameron Machine Co.
Winder, Model 460, two-drum type, 3000-fpm	Cameron Machine Co

Power system

Boiler, 90,000-lb./hr. capacity, equipped with Vibra-Grate stoker, and water-cooled grate	Babcock & Wilcox Co.
Electrical distribution system	Westinghouse Electric Corp.

Paper machine drive

The machine is driven by a 650-hp steam turbine centrally positioned in the lineshaft located on the machine room floor. Each of the eleven in-drives consists of a right-angle gear reducer, an Airflex clutch, a high speed cone pulley, an electric belt shifter, and a floating shaft coupling. The pedestal drive units in each of the dryer sections are equipped with a brake. A quick-shift arrangement is incorporated in the belt shifters at the machine calender and reel for quick slack takeup. Drive units for the four-

of the instruments and controls in the panels are mounted on the surface for immediate and easy access. In addition to the operating controls, the consoles feature a system of interlocks on the couch helper drive, the oscillating doctors, and the clutch and brake arrangement in the dryer sections.

Air system and hood

The air system consists of: (1) an "Air-Curtain" hood; (2) an air curtain supply system; (3) the basement enclosure supply; (4) the pocket ventilation system; (5) the machine hood

supplies tempered fresh air to the air curtain duct system. The aluminum ducts are located on both sides of the machine hood along its entire length. They are provided with an outlet slot at the bottom through which the tempered air is discharged to form a curtain of air around the machine to combine the advantages of both the open and the semi-enclosed hood.

The pocket ventilating system provides for high velocity, heated air supply through special nozzles to each pocket formed by the dryer rolls and the felt run.

A new American pulping process

RALPH H. McKEE
President
McKee Development Corp.

Part II – Semi-hydrotropic pulping

IN THE early development of the hydrotropic process, a rather concentrated solution of the hydrotropic salt was used as a solvent at ordinary pulping temperatures to dissolve both the lignin and the pentosans. A typical case would entail heating for 3 hours poplar, spruce, straw, or bagasse chips to 300° F. with a 30 per cent solution of the catalyst sodium xylenesulfonate ($NaXSO_3$). The solvent would then be removed by pressing, and the pulp chips refined to give an easy bleaching pulp of about 50 per cent yield.

Later work using a concentration of 1-4 or generally 1-2 per cent $NaXSO_3$, which is too low to dissolve the solvent of lignin, gave a product from which part of the pentosans but no lignin, had been removed. Accordingly, the yield of pulp, as it contains all the cellulose and all the lignin of the chips, is approximately 90 per cent based on oven dry chips and pulp. In practice it was found that this could be done at low pressure or at atmospheric pressure and accordingly the process as it has later been developed, and for which patent applications have been allowed and issued, is to carry out the process as follows:

Semi-hydrotropic process at atmospheric pressure

In a vertical open or closed stationary stainless clad digester (which can be made of aluminum if at atmospheric pressure) of a size to hold approximately three hours production of pulp, a 1 per cent solution of $NaXSO_3$ at boiling temperature is fed continuously with the chips. From the bottom of the digester, which is heated by closed steam coils, the treated chips which have been subject to three hours at cooking temperature are continuously drawn off, part of the liquor removed by passing the wet chips over a screen belt, and then the remainder of the cooking liquor largely removed by passing through a pulp screw press. The liquors which are thus removed are returned to the digester and reused in the process.

The cooked chips which are pressed and fiberized by a screw press are then mixed with wash water and run through a disk refiner, or better, through two disk refiners in series and then through a screw press. The resulting pulp can be used directly for some purposes, such as the making of paperboard. For some paper products, the pulp should be re-screened and receive the addition of size, color, clay, etc., before passing to a paper machine to be used for the making of paper or paperboard. For some products, mixtures with other types of pulp may be desirable.

Bleaching the pulp is not necessary if it is made from light colored straws or woods, since such pulp is of a sufficiently light color for catalog or newsprint use, or for the making of milk containers or paper bags. Pulp from bagasse or darker woods, such as many hardwoods, may be partially bleached by treatment with sodium hydrosulfite. Hypochlorites, under alkaline conditions, such as at a pH of 10 to 11 and at 125° F can also be used. Chlorine under acid conditions fails to bleach. Bleaching to a high white should not be attempted.

The used cooking liquor has a pH of about 3.5. While it still requires the use of somewhat acid-resistant equipment, much of the piping and process equipment can be made of low-cost aluminum instead of stainless steel.

For 100 lbs. of wood chips about 1,000 lbs. of a 2 per cent $NaXSO_3$ solution would be required, while for 100 lbs. of bagasse or straws about 1,000 lbs. of a 1 per cent $NaXSO_3$ solution would be used. After cooking three hours at about 280° F, the pulped chips are pressed to a 1:1 ratio of liquor left with the pulp. In other words, from each 1,000 lbs. of cooking solution used to cook 100 lbs. of wood chips, 900 lbs. cooking liquor will be recovered and returned at once to the cooking tank for reuse. There will be retained with the pulp 100 lbs. of cooking liquor containing 1 to 2 pounds of $NaXSO_3$ salt and costing about 5 cents a pound when made in the pulp mill. Three-quarters of this in the next stage is washed out and sent back to the cooking tank. Accordingly, the loss of chemical is not more than 10 lbs. (50 cents) for each ton of pulp produced.

If the paper mill is adjacent to the pulp mill the excess of "white water" above that reused by the paper machine should be sent back to the pulp mill to dilute the chemical used in pulping and thereby return about five pounds of chemicals to the pulp mill. In this way, both the pulp mill and paper mill will be completely free from effluent to the sewer.

The chemical, $NaXSO_3$, is easily made in the pulp plant itself at a cost of about 5 cents a pound (dry basis) but in a 40 per cent aqueous solution. If purchased, however, the chemical would have to be dried for shipment, and the drying is the expensive step in production. In consequence, the selling price of such chemical from the chemical manufacturers is much higher than the cost if made in the plant.

It is apparent from the discussion that the semi-hydrotropic pulp compares favorably with groundwood pulp both from the standpoint of low production cost and quality. It is less affected by ultraviolet light and is longer-fibered than groundwood. It has good absorption of ink and is more opaque than most chemical pulps.

Semi-hydrotropic process under pressure

The semi-hydrotropic pulping process will generally be operated under mild pressure. Some of the occasions when this becomes advantageous are as follows:

1. If it is desired to shorten the cook and thereby increase the output of pulp, the use of pressure is advantageous.
2. With a dense wood, such as many tropical woods or bamboo, the use of pressure rather than the increase of time of pulping may be desirable.
3. If a larger percentage of removed pentosans is desired increased pressure and thereby temperature may be desirable.
4. It should be called to the operator's attention, that the resulting pulp under increase of pressure is stronger but slightly darker in color than when pulped in an open tank digester. For many uses this darker pulp may not be objectionable. For most woods this color may be partially removed by bleaching with hypochlorite, or a hydrosulfite.
5. Higher pressures such as above 100 lbs. gauge are always undesirable in that much greater darkening of the pulp is obtained and some lignin is removed .
6. If the steam bled off is condensed by a surface condenser, as is necessary if volatile by-products are to be recovered, then working under a pressure of a few pounds is necessary.

Preparation of cooking liquor

The raw materials used are the common commerical grades of xylene, sulfuric acid, and caustic soda, all of which are readily and cheaply available in tank car quantities.

The method of production is, in brief, to use a reaction tank half full of sulfuric acid (the kettle having a jacket so that temperature can be controlled) run in xylene vapor slowly to act on the cooled acid. When the acid has all been used, it is cooled, diluted with water and caustic soda is added until neutral. It is filtered and is then ready to use for pulping chips.

The cost of the required chemicals (as of May, 1959) if purchased in tank car quantities is:

Sulfuric Acid 66° Be (96 per cent) ..... 1 cent, per lb.
Xylene industrial grade from petroleum or coal tar (27 to 30 cents per gallon) 4 cents per lb.
Caustic Soda (50 per cent solution) ..... 3 cents per lb.

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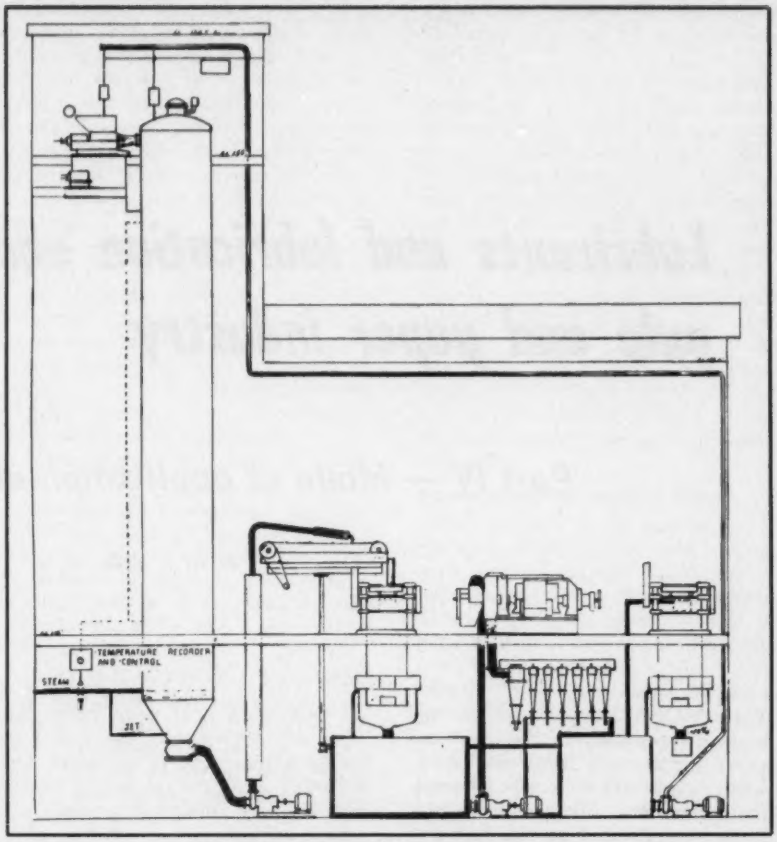


Flow sheet of a semi-hydrotropic pulp mill.

Table I

EQUIPMENT FOR SEMI-HYDROTROPIC PULP MILL

100 tons pulp daily capacity using wood as a raw material

Unless specified, all aluminum (S.S. is for stainless steel)

Quantity	Equipment
1	Digester 10 ft. by 35 ft. S.S. clad
2	Open-steam and closed-steam coils in digester
2 sets	Stirrers in digester
2	Screw defibering presses. Working parts S.S.
2 sets	Auxiliary equipment for presses, parts S.S.
2	Disk refiners S.S. working parts
2 sets	Auxiliary equipment for refiners
1	Zenith screw press with feeder. Working parts S.S.
2	Pumps for digested straw 6-in. outlets. Working parts S.S., 300 gpm, 80 ft. head
100 ft.	6-in. pipe Alclad #3 S from pumps
3	Motors 30-hp, 1200 rpm, belted to pumps
2	Liquor collection tanks 10 ft. by 18 ft. high
1	Proportioning pump, dilution to 1 per cent, S.S.
1	Centrifugal pump 175-gpm at 80 ft. head
2	Pulp storage tanks 30 ft. by 20 ft. high
1	Diluted liquor storage tank, with heating coil and agitator
1	Group controls, largely automatic
1 set	Needed valves, fittings, pipes, S.S. and aluminum
1 set	Needed belts, bolts, nuts, gaskets, etc.
	Foundations

Lubricants and lubrication equipment in the pulp and paper industry

Part IV — Mode of application of lubricants*

A. W. J. DYCK

THE VARIETY of equipment and bearing types used in the pulp and paper industry precludes the recommendation of any stereotyped lubrication procedures. The picture here is further complicated by the fact that outdoor equipment is operated under different climatic conditions and that many of the paper-making operations are carried out under severe temperature and moisture conditions.

However, the availability of lubricants specially formulated to meet a wide range of service requirements has simplified many of the lubrication problems in the paper industry and reduced the number of lubricants needed in pulp and paper making to as few as 12 to 20.

Woodyard and woodroom equipment lubrication

Principal equipment in this area consists of chain conveyors, belt conveyors, barkers and chippers. Chain conveyors as a rule require little or no lubrication due to the presence of sufficient moisture. Any additional lubrication, if necessary, is accomplished with mineral oil which is applied by drip or wick feeding.

Belt conveyors are equipped with idler rolls spaced at approximately 2-ft. intervals. Since these conveyors are located out-of-doors, they should be lubricated with a grease designed for low temperature operation or with an oil that has a pour point below the minimum temperature experienced in the geographic area of operation. On the other hand, the oil should have a viscosity high enough to preclude excessive leakage.

The mechanisms of barking drums requiring lubrication, in the case of the trunnion-mounted drum, consist of anti-friction trunnion or plain sleeve bearings and open gears. The trunnion bearings are lubricated with a soft, water-resistant grease having a high load carrying capacity. Open gears are hand lubricated or sprayed, or applied by automatic drip or jet using a heavy gear oil possessing sufficient adhesive qualities to stay on the gear surfaces and adequate pressure characteristics to reduce wear.

In the case of chain suspended drums, the chain drives, open gears and plain bearings of the reduction gears and drum guides are lubricated in the same fashion as the trunnion-mounted drums.

The chipper disc, weighing approximately 3 tons and driven at 300 to 600 rpm, is mounted on a large horizontal shaft supported by anti-friction bearings. Chipper bearings are oil-bath lubricated using mild, extreme pressure oil. Grease-lubricated shaft bearings require a relatively soft water-resistant calcium or lithium grease.

Pulp grinders

While the older type grinders, equipped with ring-oiled plain bearings or recessed cups, are generally lubricated with straight mineral oils and greases respectively, the modern grinder is equipped with anti-friction roller bearings that are lubricated with high viscosity, water-resistant, high-pressure oils from a centralized lubrication system.

Pulp washing and refining

Pulp screening is accomplished on flat or cylinder screens. Both types are equipped with grease-lubricated anti-friction bearings and require lubricants in the form of relatively soft water-resistant greases. The same greases are used in eccentric bearings, while mild extreme pressure oils are used in the heavily loaded worm gear drives.

Deckers, used in stock dewatering, are equipped with grease-lubricated anti-friction bearings and are lubricated with water-resistant greases. The gear drives often require lead soap gear lubricants.

Pulp washers are equipped with gears, trunnion bearings and discharge roll bearings. Gears and trunnion bearings are lubricated by means of oil bath or sight feed cups using a heavy cylinder oil as a protection against excessive moisture conditions. The discharge roll bearings, usually equipped with pressure grease fittings, require lubrication with a water-resistant No. 2 consistency grease.

All pulp refining at one time was carried out in beaters which now have been largely replaced by continuous refiners. Where beaters are still in use, beater bearings are lubricated with either "block" grease or a high-

*The author gratefully acknowledges the valuable contributions made in the preparation of this paper by Bruce Dunham, Sun Oil Co.; R. B. Purdy and A. I. Sippola, Socony Mobile Oil Co. Inc.; and L. B. Ward, Beloit Iron Works.

viscosity oil to give adequate protection against wear and corrosion.

The jordans and continuous refiners are motor driven units equipped with either oil- or grease-lubricated anti-friction bearings. The emphasis here is on lubricants that provide a proper sealing and therefore water-resistance is an essential requirement. When lubricating jordans, excessive application of grease must be avoided as this will add to the tendency of the jordan bearings to run hot.

Paper machine lubrication

All modern paper machines are now equipped with anti-friction bearings on all rolls. In the dryer section, where 18-ton rolls operating at 150 rpm and up are carried by heavy journals and double-roller self-aligning bearings, the latter are lubricated by means of a circulating oil system that supplies improved oil with high load carrying capacity and capable of operating under high temperature conditions. The oil should also have good demulsibility and anti-rust properties.

The operation of the paper machines at ever increasing speeds and steam pressures necessitated the development of special oils for the dryer section embodying the following characteristics:

(1) High load carrying capacities at high operating temperatures.
(2) Resistance to oxidation.
(3) Protection against rust.
(4) Detergent and dispersant qualities to prevent accumulation of deposits on the bearings.

However, there are still a considerable number of old paper machines that run at speeds of 700 fpm or less and are lubricated through block grease application. In applying block grease it is important to cut the block so that it will fit loosely in the bearing-cap cavity to prevent "hang-up" of the grease. At high temperature operation, it often becomes advantageous for the purpose of reducing grease consumption to cut the grease block so that it will cover only a portion of the length of the bearing. At very high temperatures, it may be necessary to wrap the grease in cheese cloth, the number of wraps being determined by trial and error for any particular machine.

Bearing cap covers should fit tightly so that the grease or bearing will not be contaminated with paper fly.

The block grease should be selected so that it will resist oxidation and softening at the temperature of the bearing when in operation. It should not char, crumble, or glaze.

In addition to the dryer roll bearings in the dryer section, there are felt-roll bearings, felt-guide mechanisms, spring-roll bearings, dryer gears, silent chains, inshaft bearings, exhaust fan and motor bearings, etc. All these bearings have to be automatically lubricated by using grease-packing bearings, bottle oilers, wick-feed cups, and ring-, chain- and collar-oiled bearings as well as circulating systems.

Oils used in felt-packed reservoirs in the bearing cap, wick and bottle-oiled bearings must have good film strength, contain anti-wear additives and have heavier body than needed when lubricating with a copious oil supply. Oils of approximately 600 S.S.U. viscosity at 100° F, or heavier, are used in these applications.

Oils in the ring-, chain- or collar-oiled bearings are continuously exposed to high temperatures and must have the highest possible chemical stability to resist deterioration and formation of deposits over 6 to 8 months periods of operation between shutdowns when the reservoirs are drained and refilled.

Wet end lubrication of the paper machine has its own special problems. All rolls operate under exceedingly wet conditions and require greases with a high degree of resistance to water washing and the ability to protect against rusting.

Previously calcium soap greases were used in wet end lubrication. These were almost entirely replaced by the multi-purpose lithium soap greases. However, improved calcium complex soap greases are now being reintroduced for this application due to their lower water absorption characteristics.

Paper machine drive gears (dryer section)

Dryer gears on high-speed modern paper machines are completely enclosed and are lubricated through sight-feed glasses by the same oil circulating system that supplies the dryer roll bearings.

The open gears of slower running machines are lubricated with a lubricant that will stick to the gears subsequent to application and will not be thrown off by centrifugal force or be pushed aside by the intermeshing teeth. The lubricants used for this purpose are heavy-bodied, tacky products that often have to be heated before they can drip on the revolving teeth. In another type of application, a lubricant is used that has been made less viscous — to permit cold application — by the addition of a non-inflammable, volatile diluent which evaporates after application to leave the same heavy-bodied viscous product on the gears. These lubricants can be dripped on by hand, or applied by drop-feed cup or by a force-feed lubricator.

Some dryer rolls are driven by fully enclosed silent chains. These can be lubricated with oil supplied as a spray from the oil circulating system supplying the dryer bearings. The characteristic property of the oil here is that it has high film strength to withstand the bearing pressures between chain surfaces and be sufficiently light in body to penetrate to the snuggly-fitted interior surfaces between links and pins. It must also contain (1) an anti-oxidant since the chains are exposed to the oxygen of the air, and (2) a rust inhibitor because of the presence of water vapor and condensed moisture.

Paper machine section drives

The sections of a modern paper machine receive power from a common lineshaft through differential or hypoid drive units. Each differential drive unit feeds power through a transfer gear case to the machine section. These units are supplied continuous lubrication from a central system which is separate from the main machine lubrication system. A mild extreme pressure type gear oil is used for these drives. Each differential unit is connected to a variable speed regulator having its own splash lubricating system. Straight mineral oil of high viscosity is used in these units.

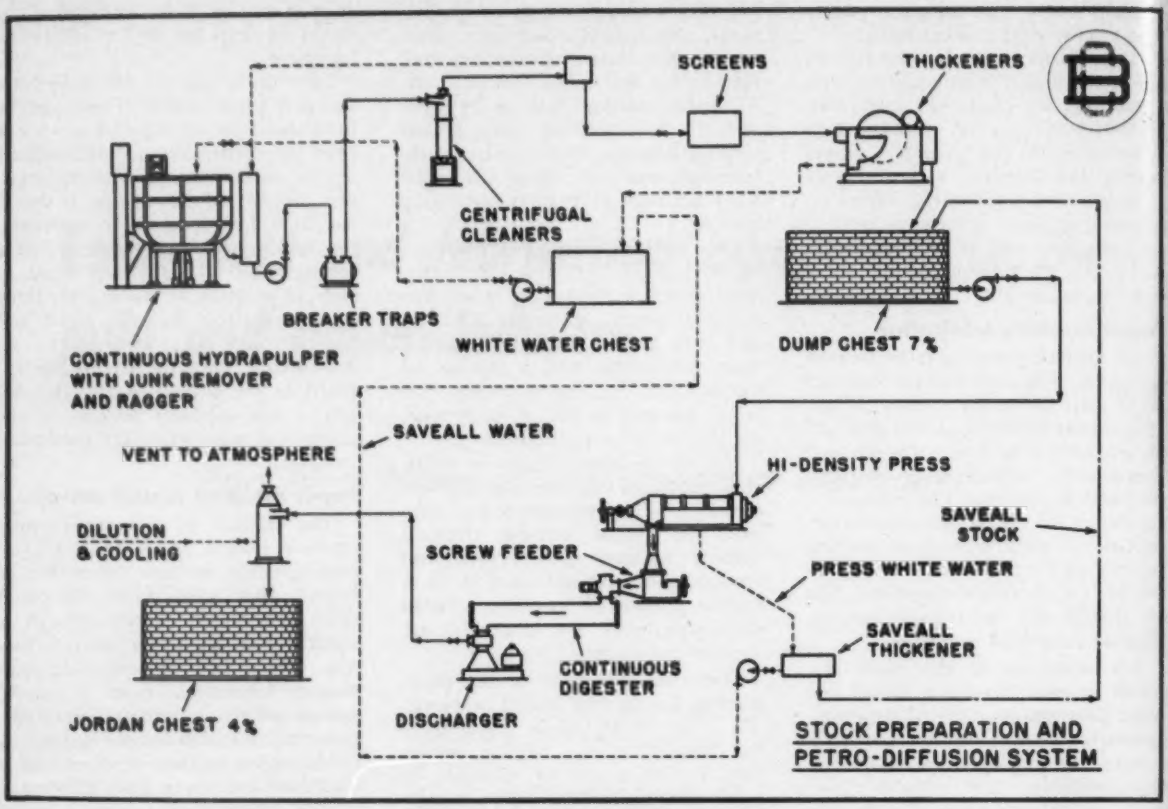
Hypoid drive units are splash lubricated from internal sump, and require a mild extreme pressure gear oil of medium viscosity. They receive power from the lineshaft via belts and transfer it to the machine sections through inshafts.

Lubrication requirements of the steam turbine (which is the prime mover of many paper machine drive systems) is most rigid. Whether the turbine is lubricated by a circulating oil system or by ring-oiling, the basic requirements are the same, with the exception that a heavier-bodied oil is required for ring-oiling since the bearing runs at a higher temperature.

Turbine oils must have (1) superior resistance to oxidation because the oil is subjected to high temperature and agitation in the presence of air and impurities; (2) maximum anti-rust qualities to prevent wear and interference of rust particles with governor action; (3) ability to separate readily from water and prevent formation of emulsions; (4) extra film strength to minimize wear during boundary lubrication at times of low speed operation, starting and stopping.

The lubricant used for circulation- or splash-oiled reduction gears is sub-

(Continued on page 419)



Flow-sheet of the Petro-Diffusion system.

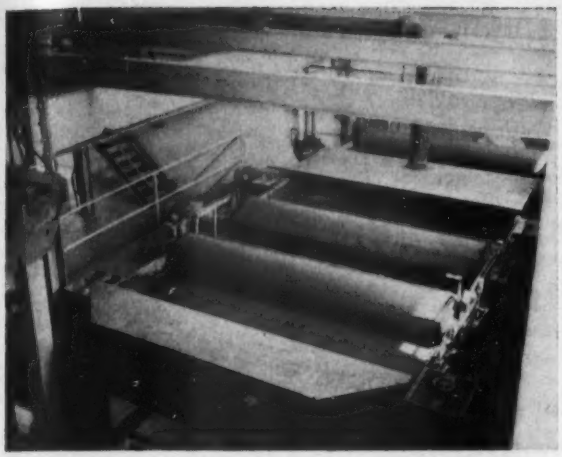
New Petro-Diffusion System eliminates asphalt problem at Elk Paper Co.

▶ The Petro-Diffusion system developed by Black-Clawson and now in operation at Elk Paper has resulted in improved appearance of the paper and in reduction of machine shut-downs.

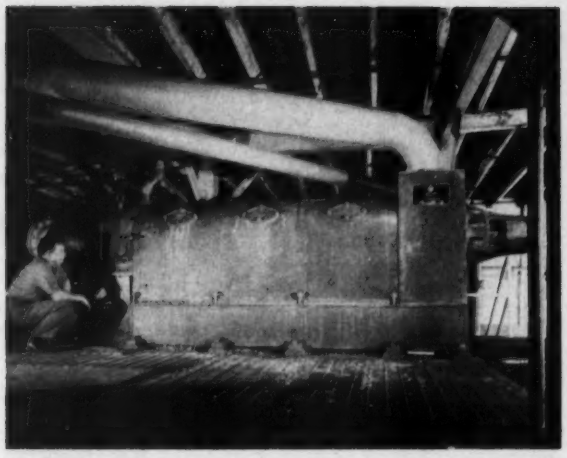
A NEW system of equipment to improve the cleaning of waste corrugated stocks is now operating in the mill of Elk Paper Mfg. Co., Childs, Md. Designed especially to disperse asphalt and various thermoplastic materials present in waste furnish, the system has successfully up-graded the appearance of the .009 corrugating board which Elk manufactures for the packaging industry and has greatly reduced the frequency of shut-downs for cleaning paper machine wires and felts.

Known as the Petro-Diffusion System, the new installation combines mechanical cleaning and continuous heating equipment manufactured and supplied as a complete unit by Black-Clawson Co., Shartle Division, Middletown, Ohio.

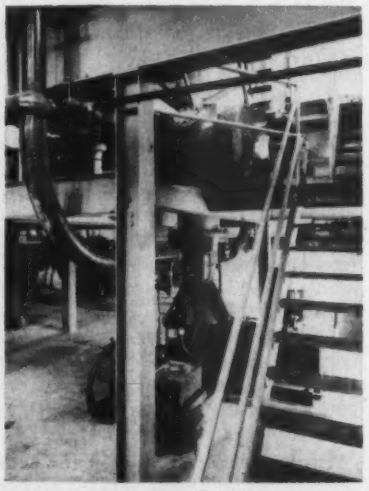
The P-D System development provides a compact, low-cost equipment package to solve a specific problem; namely, that the asphalt and similar saturants and laminants in waste paper stock have long been a costly and troublesome burden to many board mills. Ordinary methods of cleaning and refining do not remove or disperse the agglomerated materials sufficiently to eliminate visible spotting of the end product and the clogging of paper



Stock from the waste paper cleaning system is thickened to 7 per cent consistency in three new thickeners preparatory to treatment in the P-D system.



W. Francis Bathon, vice-president and mill manager, inspects the high-density press which delivers waste paper stock at 35 per cent consistency to the Pandia digester.



Continuous heating and blowing under pressure is accomplished in a single Pandia digester and discharger equipped with twin blow lines.

machine wires and felts. The problem is intensified by the troubles that converters and printers experience with asphalt spotted board.

To achieve effective dispersion, the P-D System employs a two phase treatment. The mechanical cleaning phase produces uniform stock with the asphalt particles well distributed. Subsequent heating of the stock under pressure in a modified Pandia continuous pulping system then melts the particles to the point where the oils and tars are partially vaporized and the remaining carbonized sediment becomes thoroughly diffused in the fibers.

Operation in the Elk mill

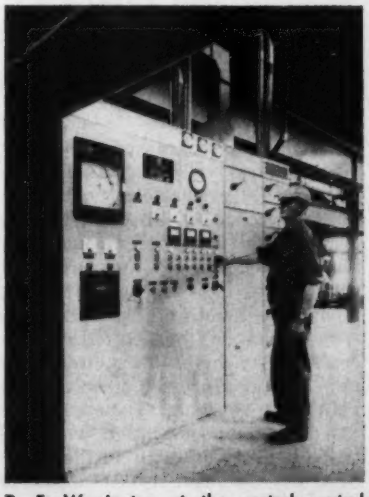
The Childs mill of Elk Paper Mfg. Co. produces approximately 165 tons per day of .009 corrugating medium from waste corrugated box papers. The production is made on three fourdrinier machines trimming 87 in., 90 in. and 112 in.

Ahead of the Petro-Diffusion System, the baled waste is slushed in a hydrapulper with ragger and junker and given primary fiberizing and cleaning in two breaker traps, two vibrating screens and centrifugal cleaners.

The stock then goes to three new thickeners which discharge to a dump chest at 7 per cent stock consistency. White water from the thickeners is collected and pumped to the hydrapulper for dilution. An HMSS pump moves the thickened stock directly to the inlet of a high-density press which raises the consistency to approximately 35 per cent. White water drainage from the press is returned to a saveall thickener.

The stock drops from the discharge of the screw press directly into a 15-in. screw feeder, feeding the Pandia continuous digester. The digester consists of one 36-in. dia. tube with a 28-in. discharger. Steam at 80 psi is introduced into the digester tube to raise the stock temperature to approximately 300° F. At this temperature the asphalt reaches a fluid state most suitable for diffusion.

From the discharger, the stock is blown continuously through two motorized discharge valves and blow lines to a cyclone tank where dilution water is added. The stock then drops to a storage chest that supplies the jordan refining system.



D. E. Warrington at the central control station of Elk's P-D system that has led to marked improvement of the finished paper.

Since its start-up in April, the P-D System has maintained a capacity of 165 tons per day and has attained 180 tons for several prolonged periods. Steam consumption averages 1660 lbs. per ton and power consumption is 1 hp/t/d.

In addition to marked improvement in the visual appearance of the paper and reduction in machine shut-downs, the vice-president & mill manager at Elk, W. Francis Bathon, reports that the system has contributed to improved sheet formation and a higher standard of .009 quality tests, as confirmed by independent testing laboratories.

Bonded fabrics offer new markets for the paper industry

PETER W. SHERWOOD

Research Engineer

Production of bonded fabrics in the U.S.A. was estimated at 90 million lbs. with an anticipated output in 1964 of 170 million lbs.—just to meet expansions of present markets.

BONDED fabrics are viewed by paper manufacturers as a potentially suitable area for profitable diversification. Main attraction of these products is their adaptability to the manufacturing techniques which are current in the industry, high unit value, and the rapid growth rate of the market.

By definition, bonded fabrics are continuous webs of fibers, treated or processed in a manner other than by knitting or weaving. These materials are offered in competition with specialty papers and with textile materials, but the main market impact to date has been in new areas of application.

Either wet or dry methods may be used for production of bonded fabrics. Especially wet methods are suitable for eventual application of paper manufacturing machinery. However, two major obstacles must be overcome.

Two obstacles

One of these is inadequacy of the market. The United States market for bonded fabrics in 1960 has been estimated at approximately 110 million pounds. This volume can be turned out by two medium-size (120-in. trim) bonded fabric machines. And here it must be borne in mind that the total volume of bonded fabrics is made up of many different types of fiber and binder. The paper industry's interest in these fabrics is shifting from cellulose to synthetic or semi-synthetic fibers which exhibit more of the particular properties demanded by the specialty markets.

The second shortcoming is technological. St. Regis Paper Company's Carlson points out that wet processes can, at present, be employed only for fibers which have a length:diameter ratio below 500:1 since uniform dispersions are a major problem at higher ratios. In effect, the fiber length is thus limited to ¼-in. for wood fibers and to ½-in. for cotton and man-made fibers in the 1- to 3-denier range. This is well below the 1-in. minimum fiber length which is called for by most marketable bonded fabrics.

Thus, the paper industry's development of bonded fabric technology is toward use of longer fibers and converges with the textile industry's oppositely directed trend. Bonded fabrics are therefore beginning to constitute a product area in which the two industries overlap in increasing measure.

The market

For the paper industry; the field is well worth developing. Production of bonded fabrics in the United States has risen from 15,000 lbs. in 1945 to an estimated 90 million lbs. in 1959. Conservative predictions look to a 1964 output of at least 170 millions — just to meet expansion of present markets, while the possible penetration of established textile markets will raise the anticipated level for bonded fabrics well above 225 million lbs. five years from now.

Already, this growing field is characterized by strong competition. In the United States, some 10 to 15 firms have established outstanding market positions — among them Pellon Corp. (Interlinings), Avondale Mills (padding and backing), Chicopee Manufacturing (toweling, draperies, interlinings), etc. Activity is also strong in Europe (15 plants, with England and West Germany in leading position), in Latin America (at least two plants on stream), Japan (three plants), South Africa (one plant), and Australia (one plant).

Largely hampered by too much secrecy, technology of bonded fabrics has lagged badly behind market development. Only the last three years have seen important technical progress, centered largely on binders employed for bonded fabrics and, secondarily, on machinery for manufacture. Initial work was concentrated on upgrading scrap fibers by production of bonded fabrics. With improved choice of fibers and binders, better web construction has become possible, allowing expansion into new fields.

In large measure, the expansion of bonded fabrics has been in new areas of application (see below) where their relatively high cost could be justified by performance superior to that of conventional textile fabrics. However, there are marginal areas where the two types of fabric compete. With further improvements now being made in fiber-web formation, production efficiency, and materials employed, this competitive area is expected to widen.

Materials used

Both natural and synthetic fibers are employed in non-woven fabrics. Chemical and Engineering News estimates that, in 1958, natural fibers (fur, hair and wool) constituted 40 per cent of the market. Of the 60 per cent taken up by synthetics, viscose rayon accounts for about two-thirds, with the balance split evenly between acetate rayon and complete synthetics (mainly scrap nylon, with minor amounts of Dacron and acrylics). Drawback of synthetics is high price, offset rarely by such advantages as higher resistance to heat, chemicals, moisture, greater strength, etc.

Binder content and composition of bonded fabrics varies widely, average content is 30 per cent. Bulk of production calls for liquid binder systems, mainly water-emulsion type. Included among binders in this category are polyvinyl alcohol, casein, cellulose xanthogenates, etc.

Other binder systems of commerical interest, though on a lesser scale at present, are powder binders and plastic fibers. In both cases, thermoplastic or thermosetting resins may be used. Of the two techniques, powder binder methods are hampered by poor distribution of the web, while fiber binders are more costly. Of the two systems, only the latter has achieved commercial signifiance, for specialty applications (e.g., ribbons, filter fabrics).

Choice of resin employed as binder determines in large measure the properties of the product and is thus geared to end-use requirements. Low-cost resins — starch, casein, etc. — are employed for production of batting where no objection exists to the brittleness, poor hand, and low wet-strength associated with binders of this type. Polyvinyl acetaté, a medium-priced fiber, is characterized by excellent light- and heat-fastness, but poor resilience, softness, and wash-fastness. It serves in the production of dish cloths, wiping and polishing cloths.

Good strength and elastic properties make butadiene-acrylonitrile and butadiene-styrene resins suitable binders for upholstery fabrics, interlinings, and similar application. However, to get adequate softness and drapability, high concentration of these binders are required with consequent high cost. Of the two systems, better cleanability, washability, and sealability is exhibited by the more costly acrylonitrile type. Both types suffer from incompletely satisfactory light- and heat-stability and from development of odor as the product ages.

Latest entry in binder selection are acrylates and nitrile latices. The acrylates offer a wide group (methyl methacrylate, ethyl acrylate, butyl acrylate, etc.) for different application. Goodrich Chemical Company's Neil Sherwood reports that nitrile latices come closest to meeting all binder requirements. Outstanding results are reported for carboxylic nitrile latex blended with 5 to 10 per cent of a methylated methylol melamine resin.

Web-formation techniques

Future growth of bonded fabrics is also tied to the development of manufacturing techniques for producing the web of the fabric. Three main methods of web formation are current: (1) parallel-laid, in which all fibers run in the same direction; (2) cross-laid, in which an upper and lower layer of fibers run parallel while an intermediate layer runs at right angles thereto; and (3) random-laid, in which the fibers are run in truly random fashion. Most of the newer bonded fabrics plants produce random-web fabrics and it is in this field that the greatest growth potential is seen because the product is characterized by high strength in all directions, and because their manufacturing technique is particularly suitable for high-speed production.

End-uses

End uses for bonded fabrics may be classified into three major categories: durables, semi-durables, and disposables. Biggest factor today are durable uses — thermal insulation, wall covering, apparel interlining, air filters, shoe interlinings, backing for vinyl-coated fabric and vinyl film. The latter application is particularly significant for automobile seat fabrics and has been adopted by several leading automobile makes (including Ford, Buick, Studebaker and Oldsmobile). Potential for this one outlet alone is 75 million lbs. per year.

Semi-durable uses for bonded webs include vacuum cleaner bags, polishing cloths, table cloths, seed carpeting and window drapes. In the field of disposable products, they serve in napkins, diaper linings, medical dressings, filter fabrics, guest towels. Here, lower-cost materials must be employed and, even so, the market is severely restricted by competition of more conventional paper products.

Biggest uncertainty in the long-range market outlook for bonded fabrics is their adoption in outer garments. As yet, this use is minor. Chemical and Engineering News estimates total consumption of bonded fabrics in ties, suits, dresses, handbags, etc., at ten million lbs. per year. Development of products in this area is held back by the lower cost of woven textiles and by style considerations. However, fashions change and significant technical developments in the field are expected. One cannot therefore discount the possibility that bonded fabrics will find a niche in the field of outer garments, thus adding a major outlet to their more immediately apparent markets.

Application of lubricants

(Continued from page 415)

ject to equally severe conditions and, for this reason, turbine lubricating oils are usually used in the service as well.

Lubrication of electric motor bearings

Electric motor plain bearings are lubricated with oil rather than grease — usually by the ring-oil system. Some very large motors also employ the circulating-oil system, while others may use waste-packing or special wick-feeding.

Special oil characteristics for lubrication of plain motor bearings include (1) correct viscosity to assure complete distribution and fluid film formation; (2) high oxidation stability; (3) high film strength; (4) good anti-rust properties; and (5) ability to separate quickly from water and prevent formation of emulsion.

Anti-friction bearings, both ball and roller, are designed for either oil or grease lubrication. However, grease lubrication is often preferred for the following reasons:

(1) Grease is easily retained in properly lubricated bearings. This reduces grease consumption and prevents contamination of motor windings.
(2) Grease has good sealing properties.
(3) Grease lubrication requires less frequent attention to bearings.

When oil lubrication is used in anti-friction bearings of electric motors, both bath and circulation systems are used. Oil characteristics are the same as required for plain bearings lubrication.

Lubrication of finishing and converting equipment

Individual pieces of equipment operating in this area such as coaters, cutters, trimmers, folders, bag machines, etc., are usually equipped with centralized lubrication systems which apply grease to all bearings at the proper time and in the proper quantity.

Filming amines speed drying rate in paper mills

H. E. EIGNER

Product Engineer
Dearborn Chemical Co.

THE SPEED of drying depends upon the rate at which heat leaves the steam inside the roll, passes through the roll, and enters the sheet of paper.

A number of factors affect the rate of heat transfer—the type and thickness of dryer roll metal, the film or layer of condensing steam, the layer of scale or dirt on the inside of the drums, the layer of scale or fuzz on the outside of the drum, and the interface between paper, air and water between the drum and the paper.

The rate of heat transfer can be increased through application of several standard techniques; for example, proper venting of dryer rolls for removal of non-condensable gases, removal of deposits of corrosion products, prevention of further corrosion, and formation of an inside metal surface condition that causes dropwise condensation.

Effective venting of gases is important since such gases reduce the partial pressure and quantity of steam maintained in the dryer roll, thereby reducing temperatures on the steam side. The gas also has a blanketing effect that prevents efficient steam contact on condensing surfaces.

Heat transfer rates can also be increased by elimination of the layer of scale and corrosion products that accumulates on the steam side of the dryer rolls. This can be done effectively with filming amines, which both remove deposits and prevent further corrosion, thereby preventing a recurrence of this problem.

In addition, filming amines promote drop-wise condensation.

When steam condenses in droplets rather than in layers, it rolls easily off an inclined surface of the dryer roll just as water rolls off a newly waxed car. Thus, there is no layer of condensate between the heating steam and the dryer roll surface. This produces an increase in the heat transfer rate.

The maximum heat transfer rate through a dryer roll cannot be obtained if rolls are rotated at a rate greater than the rimming speed—the speed at which condensate is carried completely around the inside of the drum due to centrifugal force.

Since the wax-like film created by filming amines causes water to roll more easily down the sides of the rotating dryer roll, rimming does not occur until much higher dryer roll speeds.

The net result of increases in heat transfer efficiency is to speed the flow of heat from steam to the paper, thereby cutting the time that paper must be in contact with the dryers.

Since faster drying means that the paper will be dried further on back from the end rolls, steam to some of the rolls can be cut off or the machine can be speeded up.

Filming amines not only permit gain in paper production where it is possible to increase mill speed, but also a gain in efficiency as measured in pounds of steam to produce a given tonnage of paper. Since the amount of heat required to evaporate a given quantity of water from paper is the same regardless of the rate at which it is applied, this gain in efficiency of drying is due to a reduction of the percentage of steam required for heat losses. As these losses are set by the radiation losses from each roll, use of fewer rolls or drying more paper on the same number of rolls materially decreases the portion of steam required for losses compared to that actually used for drying.

Thus, increasing heat transfer rates by use of filming amine not only permits greater mill production of paper, but also reduces the amount of steam required per ton of paper produced.

Semi-hydrotropic pulping

(Continued from page 413)

The chemicals are used in the proportion of 1 lb. of sulfuric acid to 1 lb. of xylene, and .4 lb. of caustic soda, which produces 2¼ lbs. of salt at a cost of 6.2 cents or 2.8 cents per pound.

Total chemical process cost is as follows:

Chemicals	2.8 cents per lb.
Steam, overhead and labor	1.0 cents per lb.
Tank car freight on raw chemicals	1.0 cents per lb.
Total cost of sodium xylenesulfonate	4.8 cents per lb.

Each ton of semi-hydrotropic pulp requires about 10 lbs. of this salt as a "make-up", or 50 cents chemical cost per ton of pulp. No plant for recovery of chemical reuse is required. No effluent exists. No objectionable odor is produced.

Minor by-products do not accumulate in the cooking liquor to prevent its reuse. Sufficient purging occurs in the pulp sent to the paper mill and by the volatile products removed with the steam from the top relief valve of the digester.

Equipment for a semi-hydrotropic pulp mill

Due to the simplicity of the process, the equipment required for a semi-hydrotropic pulp mill costs only a fraction of that of a kraft pulp mill. Also the fact that much of the equipment can be made of aluminum and that there is no chemical recovery plant needed, make this installation as a whole comparatively inexpensive.

The wood preparation to produce screened chips is the same as that for other pulping processes.

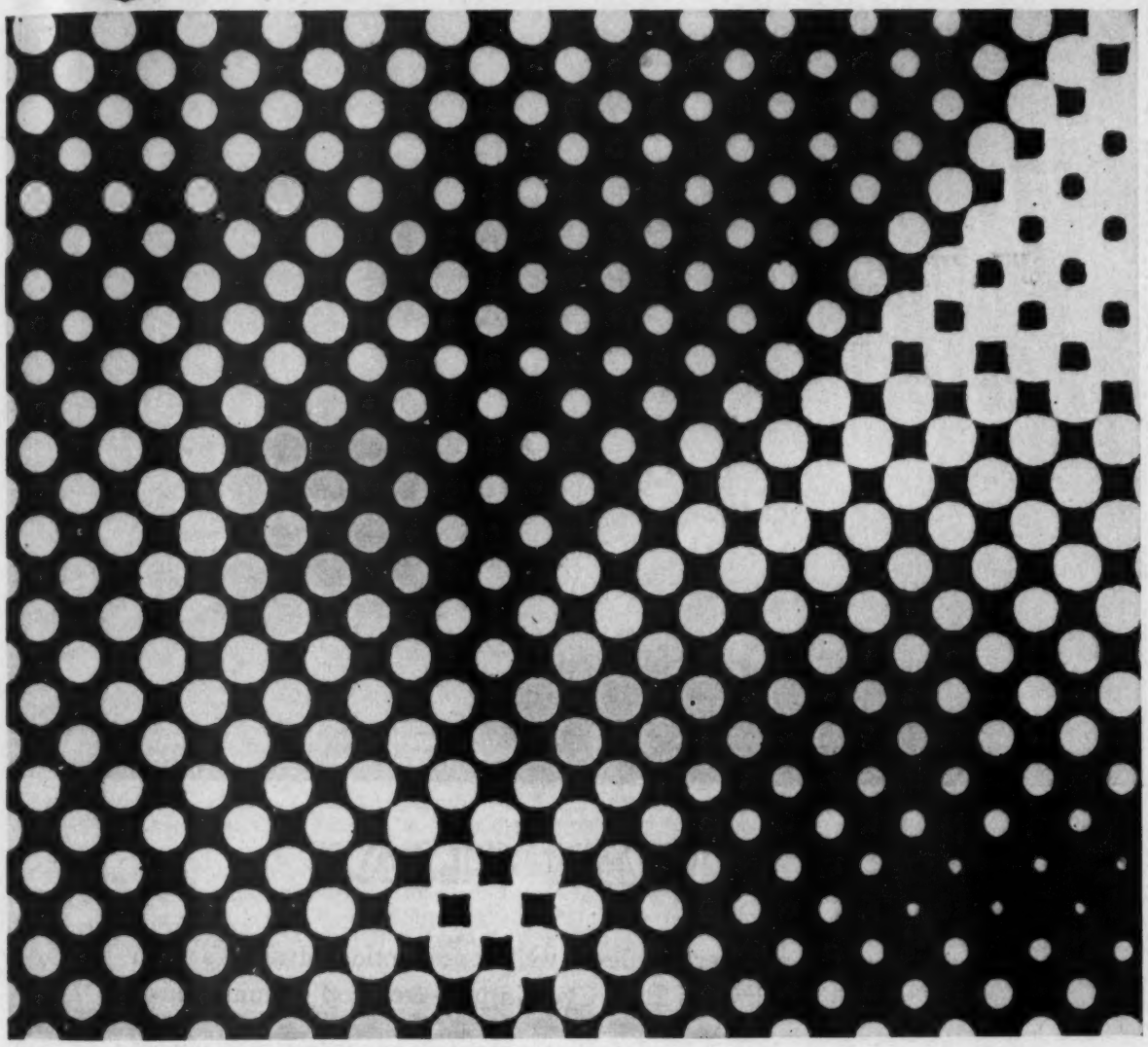
Bleaching requirements, if any, are only half those required by other processes to produce printable papers.

The essential equipment needed for a semi-hydrotropic pulp mill is shown in Fig. 3.

The installed equipment for a pulp mill will cost very close to $1,000,000. There will be additional expenses for freight and drayage, liability insurance and fire insurance during erection and an item for engineering and supervision of erection.

A small steam plant (6,000 lbs. steam per hr.), a small chemical plant ($80,000), land for mill and storage for supplies, wood handling, wood barker, chipper and chip screens, roads, fire protection etc. will be required. Presumably needed electricity will be purchased.

DOW | LATEX



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Showing some of the 280 Bird Cycleans on the job at Publishers Paper Co., Oregon City, on unbleached sulphite. These are 4" units (available with patented, non-plugging automatic purge tips). Cycleans also come in 7" and 12" sizes to meet a wide range of capacity requirements.

CYCLEAN CLEAN

You've acquired a powerful sales as well as production advantage when you put your stock through Bird Cyclean pressure drop cleaning units.

Cycleaned paper gives you a definite competitive advantage over papers made from stock without benefit of *cycleaning*.

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CURRENT COMMENTS

Renewed tariff rate reductions — Industry now using paper clothing

WARREN B. BULLOCK

The paper industry is facing a renewed series of tarrif rate reductions in negotiations to begin in a few months, chiefly with European nations. Newly enacted legislation permits a five per cent reduction each year for the next four years.

Among the grades scheduled for the tariff axe are coated book paper, tissue paper, fancy paper, greaseproof and glassine paper, wrapping paper, writing paper and cigarette paper, and paperboards. Various paper trade associations appeared during July before the Committee for Reciprocity Information to present arguments against any further reductions in duty rates, already the lowest in most of the civilized nations.

The domestic lithographic industry, an important consumer of high grade papers, protested against the special 20 per cent concession to Cuba which has provided cigar bands and labels for the United States tobacco industry. The lithographers also protested against concessions to Cuba to help the pro-Communist regime of Castro's Government finance its anti-American campaign.

Meanwhile the National Democratic convention reaffirmed its program for the continued reduction of duty rates and, as one newspaper writer phrased it, "gave the back of its hand to the supporters of protectionist trade policies". In compensation for any losses to labor the program might entail, the platform proposes "direct loans, tax incentives, defense contracts priority and retraining assistance" for individuals. Under this provision, highly trained experienced machine tenders and other skilled paper mill employees would have to learn new jobs to replace those lost through foreign competition.

High sales — low income

Developments in the financial area indicate that despite continued increases in sales volume, as well as production, income has not kept pace with the rise in sales. In fact, a flood of financial reports now available for the first half of the year, in some cases indicate lower income in the second quarter than prevailed in the first three months. Some price cuts have contributed to the less optimistic picture. St. Regis, for instance, in a formal report to stockholders, cites competition and price reductions in multi-wall bag and kraft paper as the cause of its decreased earnings. An eight per cent increase in sales volume was attributed largely to sales of companies acquired since mid-1959. The company, however, made a net profit of $27,829,500 through the sale of its Canadian multi-wall bag plants to the Consolidated Paper Corp. of Canada. Rayonier and Brown companies blamed competition in the pulp field for their decreased income.

Dollar value of folding box shipments rose two per cent over a year ago according to the Folding Paper Box Association, reaching nearly the half-billion-dollar level.

Newsprint figure goes up

Newsprint output in June reached a new high figure in both the United States and Canada for any June month in history. A wage increase in Canadian mills is given as some cause for alarm as to future profits. New wage contracts will cost $20,000,000 a year and mean $1.50 per ton added to production costs.

Paper clothing

In the research field advances are being recorded. Out in California, workers in the electronic and drug industries, particularly those employed by the General Electric Co., are wearing paper clothing. When working with radioactive materials at the company's nuclear equipment plant, these employees don disposable paper suits which are considered preferable to cotton clothing. Made of heavy-duty, fire- and water-resistant, nylon-threaded paper, they are worn once or twice and then burned in a special incinerator. They cost about $1 each and are considerably cheaper than regular clothing which must be cleaned in a special atomic laundry. From a style standpoint, it is interesting to note that the suits come in matching coat and pants, with even a matching hat.

St. Regis is not a laggard in the research field. The company has decided to build a $3,000,000 technical center in Rockland county, New York, near the intersection of important highways. Construction is scheduled to begin this fall, and the new center will concentrate the company's scattered research and development activities now in progress at several other points. The new laboratory was originally scheduled for Stamford, Conn. This is only one of several research laboratory installations under consideration by important paper companies. This is an indication that the paper industry research program is slated to become an important rival of the research programs in the chemical and other industries. The anticipated research program for the paper industry is believed by leading executives to be well on the way to an investment of four per cent of the annual sales volume, the percentage already considered a top figure in other industries where research is coming to be recognized as the key to the future.

Net incomes

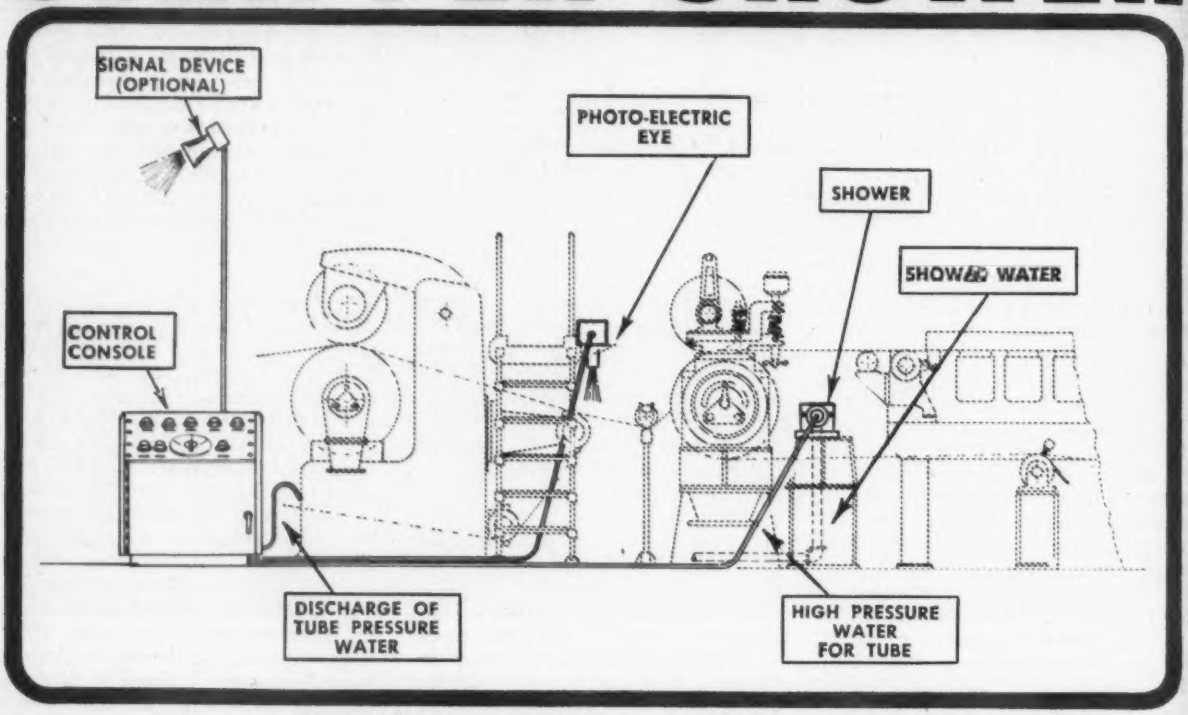
Allied Paper Corp. — Net half-year income, $63,824; a year ago, $906,315.

American Writing Paper Co. — Six-months income, $329,119; a year ago, $321,466. Second quarter income rose slightly over that of the first three months.

Certain-Teed Products. — Three months ended June 30, $731,843 and for six months, $739,229; a year ago, $1,034,935 and $1,672,760 respectively for the similar periods.

Champion Paper & Fibre Co. — Three months ended June 30, $2,132,713; a year ago, $2,538,096.

ANNOUNCING
THE SANDY HILL AUTOMATIC
STRIPPER SHOWER



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CUTS DOWN load on save-all

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AUTOMATICALLY goes to work. Signal device optional

The automatic action of this specially designed "knock off" practically instantaneously turns on the shower when the paper breaks on the couch.

The shower drives the sheet off the return run of the wire and prevents it from reaching the wash roll.

Running for the absolute minimum of time required to keep the sheet stripped off the wire, the Stripper Shower greatly reduces the load on the fresh water system and the save-all.

It relieves the machine operator of an important responsibility, and produces substantial saving in stock.

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Container Corp. — Net income for the first half of the year, $9,896,000; a year ago, $9,625,000; Profits from foreign subsidiaries reached $1,500,000 as compared with $1,000,000 a year ago.

Crown Zellerbach Corp. — Income for the half year, $20,295,000; a year ago, $19,226,000; For the second quarter, however, income was $11,179,000 as against $10,915,000 a year ago.

Federal Paper Board Co. — For 24 weeks ended June 8, $1,842,000; a year ago, $2,467,000.

Fibreboard Paper Products Corp. — First half-year income, $1,285,466; a year ago, $2,716,777.

Great Northern Paper Co. — 24 weeks ended June 19, $1,222,231; a year ago, $653,540.

Hammermill Paper Co. — 24 weeks ended June 19, $1,636,179; a year ago, $1,495,280.

Inland Container Corp. — Peak sales and earnings were recorded in the first half of 1960 with a net income of $3,316,000; a year ago, $3,111,000.

Keyes Fibre Co. — Net six months, $1,103,800; a year ago, $978,061.

KVP Sutherland Paper Co. — Income for second quarter, $1,546,001; a year ago, $1,414,013. For the nine months ended June 30, the net was $2,950,705 as against $3,433,831 for the similar period a year ago.

McAndrews & Forbes Co. — Six-months income, $329,119; a year ago, $409,311.

Mead Corp. — Income for 24 weeks ended June 12, $6,483,997; a year ago, $6,210,248.

Minnesota & Ontario Paper Co. — Six-months income, $3,195,667; a year ago, $2,915,919.

Oxford Paper Co. — Six-months income, $1,655,819; a year ago, $1,356,773.

Paterson Parchment Paper Co. — Six-months income, $231,420; a year ago, $336,081.

P. H. Glatfelter Co. — Six-months income, $1,265,722; a year ago, $1,131,751. Second quarter net was at the rate of 91 cents per share as against $1.75 for the six months period.

Puget Sound Pulp & Timber Co. — Second quarter earnings showed an advance over the first quarter with a total net income for the half year of $2,369,821, as against $2,158,694 a year ago.

Rayonier Inc. — Net income for the first half of the year was $5,860,028; a year ago, $6,592,117.

Riegel Paper Co. — Net income for six months, $1,523,642; a year ago, $1,587,200.

(Continued on page 439)

Just Arrived!

200 MORE

Giant-Size

ACL WOOD CHIP CARS

TO SERVE THE PULP & PAPER INDUSTRY

Because of your overwhelming acceptance of our first 200-car fleet of jumbo-size 70-ton wood chip cars, Coast Line is building 200 more to serve you. These cars represent just one more of the many ways Coast Line works to meet the individual shipping needs of our friends and customers in the pulp and paper industry. We appreciate your patronage and will be happy to work with you at any time to help you solve your particular shipping problems. Why not give us a call.

"Thanks for Using Coast Line"

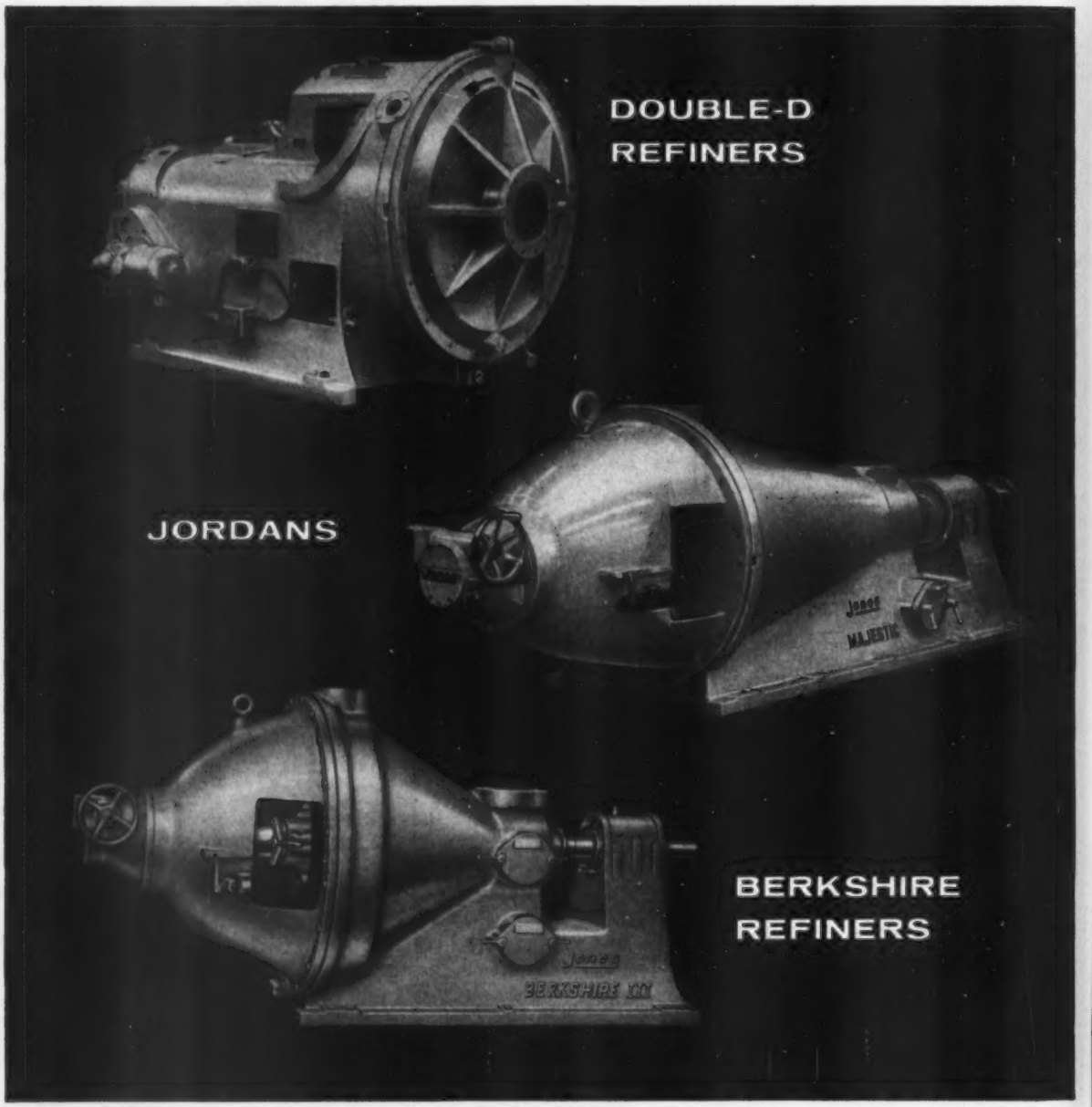
ATLANTIC COAST LINE RAILROAD

...serving the Southeast Coastal 6

For more data circle 123 on Post Card

Jones refiners

CHOICE OF THE NATION'S



Canadian Associates:
The Alexander Fleck Ltd.
75 Spencer St., Ottawa

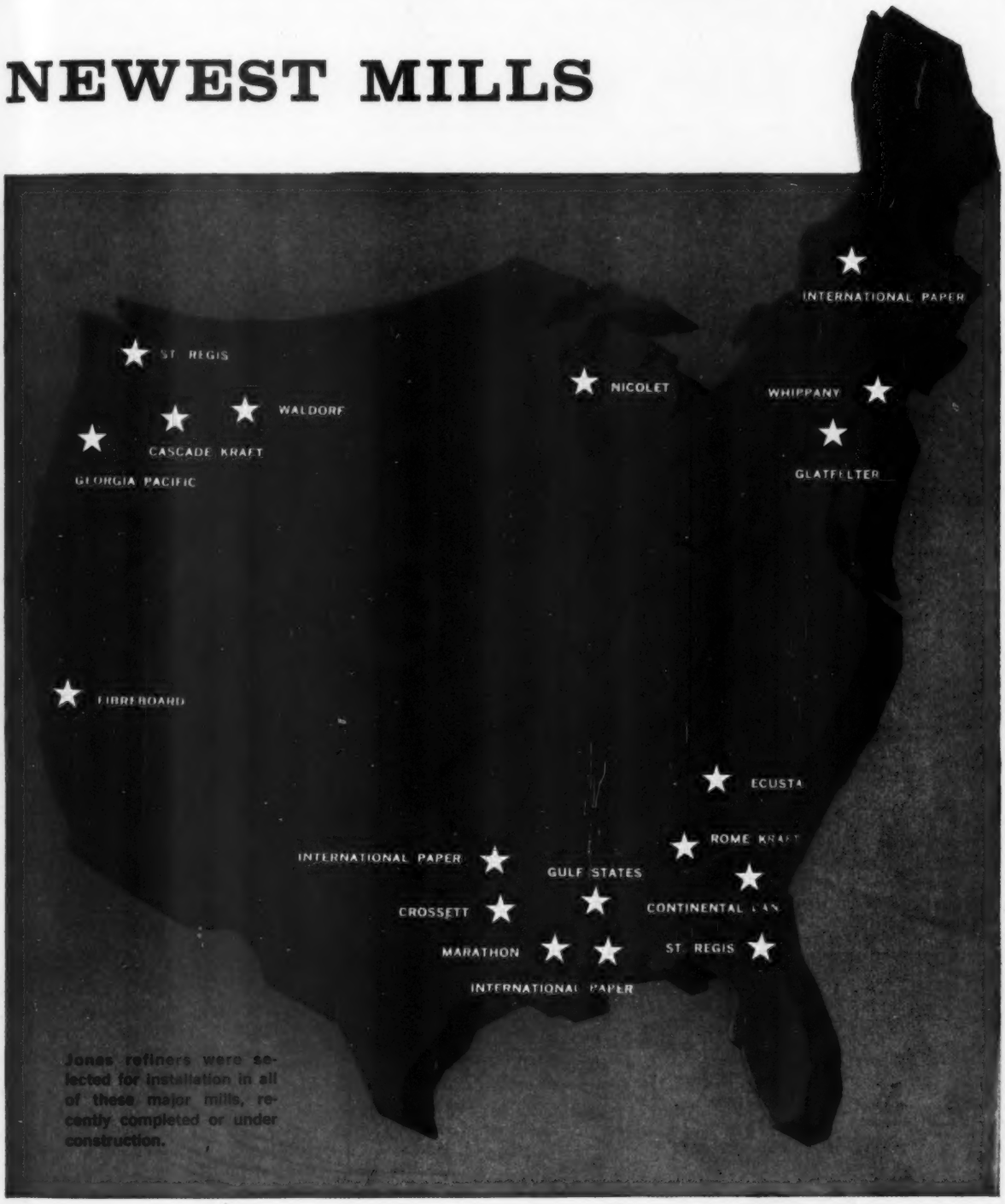
E. D. JONES CORP. · PITTSFIELD, MASS. · member BELOIT group

Jones

PULP MILL EQUIPMENT AND
STOCK PREPARATION MACHINERY

For more data circle 124 on Post Card

NEWEST MILLS



Check the record. Wherever you find new mills — mills designed and built for top performance and maximum efficiency — you're likely to find Jones refiners. There's a type and size to fit every requirement — each precision designed and custom built to fit individual mill requirements. If you are thinking of modernizing, it will pay you to include Jones in your plans.

For more data circle 124 on Post Card

NEWS of the INDUSTRY

Dr. Locke Announces Invitation To All

October 16 through 22 will be the first annual observance of national Forest Products Week. This comes as a fitting highlight to a year studded with events important to the forest-based industries.

Dr. Edward G. Locke, director of the U. S. Forest Products Laboratory, has extended an invitation to all in the forest products industries to visit the world-famed institution. The Laboratory he heads is, this year, celebrating its golden anniversary. Regularly scheduled tours are given daily at 2 p.m. These tours will be amplified during Forest Products Week. The Midwest section of the Forest Products Research Society will meet at the Laboratory that week.

Dr. Locke stated: "It is more than just happy coincidence, therefore, that the industries we work with should this year call attention to their accomplishments and progress by way of a special Forest Products Week. There is much to call attention to.

"Listed, among other major events of 1960 that directly bear on the forest industries, was the enactment of legislation by Congress that gives statutory sanction to the multiple use concept in operating the National Forests.

"With this concept legally endorsed, we can look forward to healthy development of our forests on the broadest possible front. The adoption of a greatly broadened legislative program by Congress — "Operation Outdoors" — is making its benefits felt".

"I think", Dr. Locke further commented, "that the results of 50 years of research here will convince anyone, that healthy expansion of products research is bound to have beneficial results industrywide."

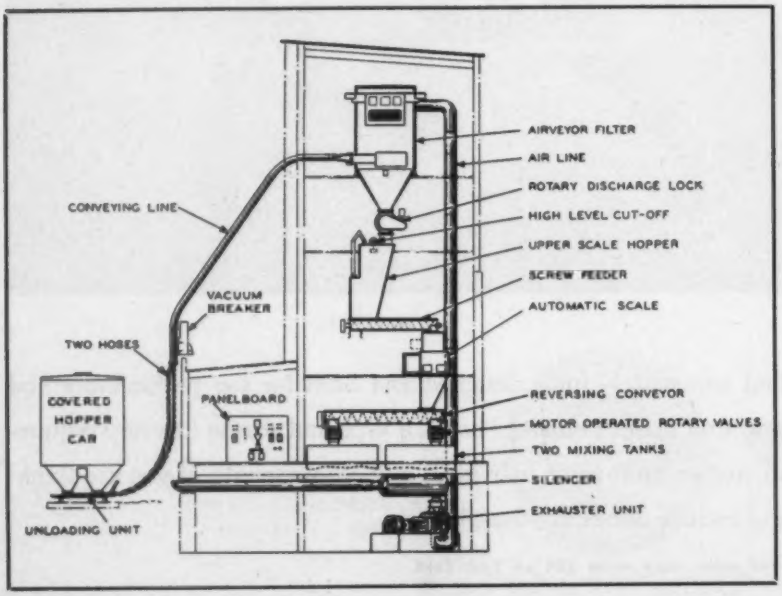
Paper Distribution Council Adopts By-laws

By-laws were adopted by the Paper Distribution Council at its organization meeting recently held in New York. According to the By-laws, the purpose of the Paper Distribution Council is "to identify and define areas in the business of distribution of the products of the paper industry, where problems exist, and to attempt to ameliorate such problems by informal discussion and the interchange of experience and views, with the purpose of improving service and efficiency for the mutual benefit of producers, merchants and consumers".

The organization plans to hold two meetings annually — one in the Spring, and one in the Fall. The next meeting of the Council has been scheduled for November 28 in Chicago.

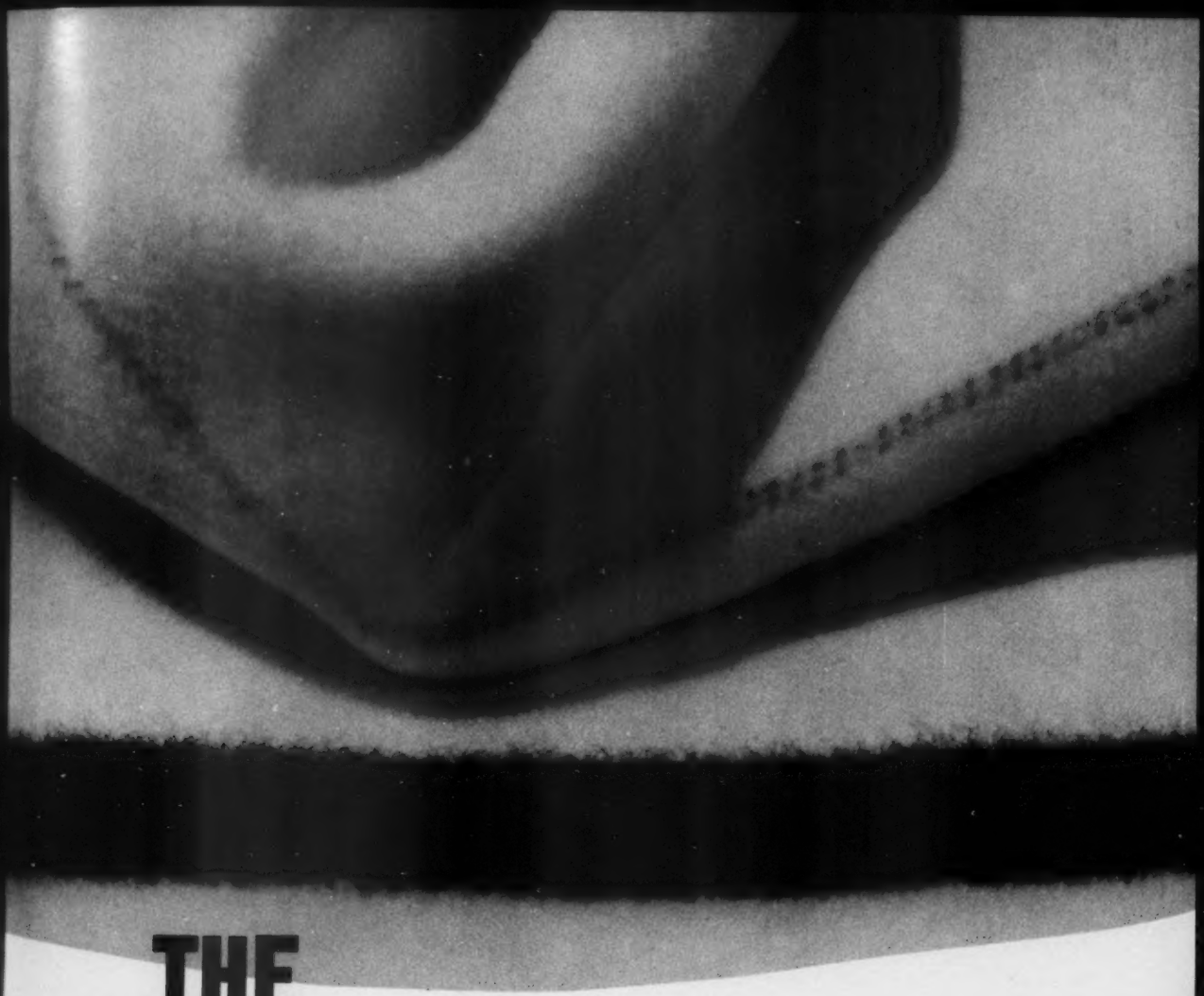
New York & Pennsylvania Cuts Clay Handling Time

Increased industry demand for coated stock has created a need for larger quantities of coating preparation than manual clay handling could meet for New York & Pennsylvania Co. Therefore, an automatic system has been built into a recently completed clay preparation tower. The new system enables one man at a master control to unload 25 tons of bulk clay an hour. Prior to the new system, this clay was received at the company's Johnsonburg mill in bags, where it took four men a full day to unload one car of 600, 100-lb bags. Such operations were not only time-consuming, but often would result in clay loss through mishandled bags and cause a serious dust problem.



This new tower was built alongside a railroad siding (see illustration). Covered-hopper cars, holding 50 tons of clay divided into two sections, pull up adjacent to this tower. Then a dual-feed unloader is attached to the enterprise gates at the bottom of the car. Then, after hooking up air and conveying line hoses to the car and the unit, and opening the car outlets, the operator starts a blower.

Material drops by gravity through the two gates directly into the unloader and then into a pneumatic vacuum system which sucks the clay 50 ft. up to the filter on the top floor of the preparation building. The filter separates the clay from the conveying air, which is piped to an exhauster to provide both the activating air and the vacuum for the entire system. Power requirement for the exhauster is 100 hp.



THE MARK OF THE BEST IN FELTS

The blue and red stripes on this Super Plate Press Felt have identified all Huyck felts for close to 90 years.

No other feltmaker has come forward with so many "firsts" in feltmaking and felt services as Huyck. No other felt has ever offered more advantages and economies.

Look for these familiar blue and red stripes on your felts and felt packages—THE MARK OF THE BEST IN FELTS *for your machines.*

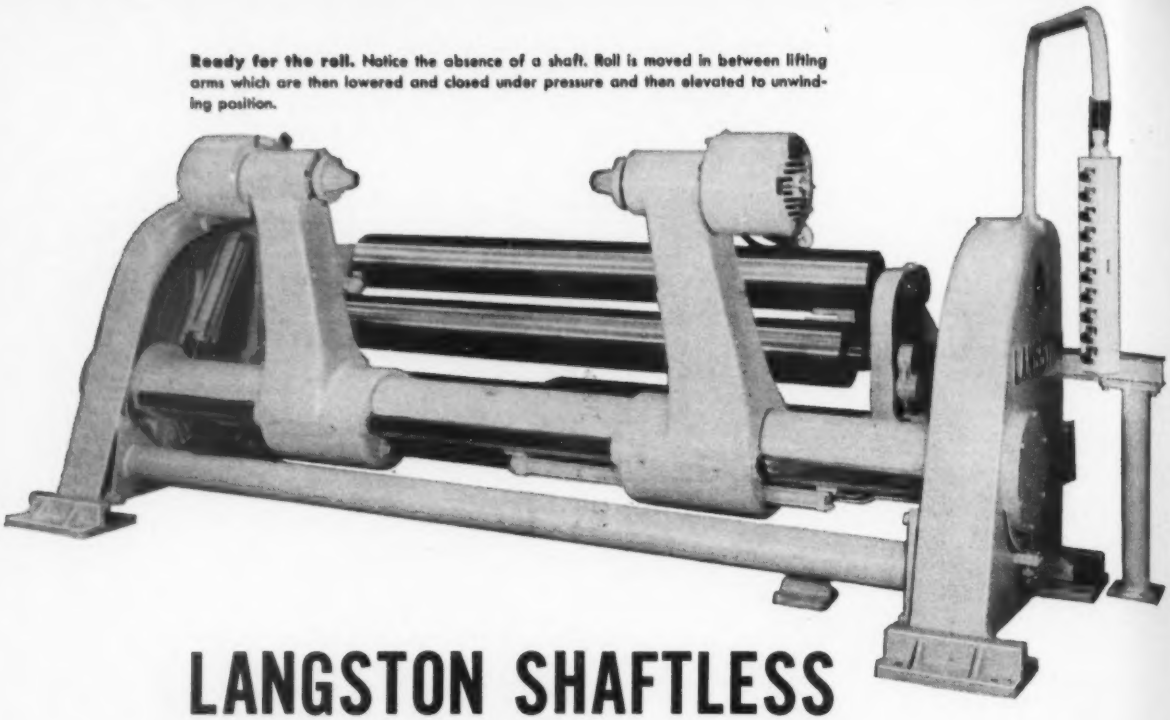
HUYCK FELTS

Huyck Felt Co.,
Rensselaer, N. Y.;
Aliceville, Ala.;
Division of F. C. Huyck & Sons.
In Canada: Kenwood Mills Ltd.,
Arnprior, Ontario

NEW HUYCK FELTS ★ INDUSTRIAL FABRICS

FIRST IN QUALITY • FIRST IN SERVICE SINCE 1870

Ready for the roll. Notice the absence of a shaft. Roll is moved in between lifting arms which are then lowered and closed under pressure and then elevated to unwinding position.



LANGSTON SHAFTLESS UNWIND STAND

Boost your production . . . reduce your slitting and rewinding costs

Easy, fast, completely safe. One man does everything. Operating push-button controls, he closes lifting arms, elevates roll, sets brakes.

One man can load the heaviest roll. No heavy shaft to handle. No cone tightening. No couplings to engage. No crane lifting. Just pushbuttons. This is the Langston standard shaftless unwind stand for rewinding and converting applications.

You not only save time, you also get better unwinding. Roll can be positioned laterally by push-button control—even when the machine is running. It's held firmly under pressure for complete safety throughout the unwind. Several braking arrangements can be provided to handle a wide range of grades and conditions. Available extras provide for handling very narrow rolls; for constant tensioning; for automatic braking of idler rolls; for automatic web alignment and side register control; for web oscillation; and for local or remote control.

This new Langston shaftless unwind stand can be used with any make of slitter. Available for maximum roll widths from 36 to 140 in. and diameters from 14 to 84 in. For complete information, write Samuel M. Langston Co., Camden 4, N. J.

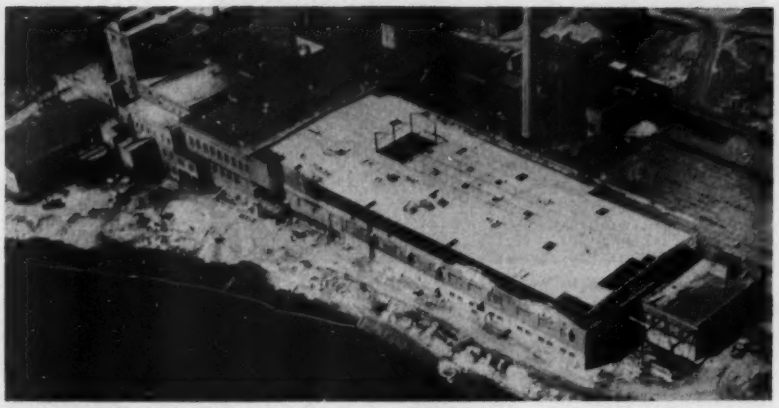
SHEAR CUT CLEAN CUT

LANGSTON *Leadership...by design*

For more data circle 126 on Post Card

Recent Expansions in the Industry

Here are "on-the-spot" progress photos which give a pictorial report of the progress on the multi-million-dollar expansion program now in process at Wausau Paper Mills in Brokaw, Wisconsin.



Aerial view of Wausau Paper Mills Co. showing the new machine room now being completed.

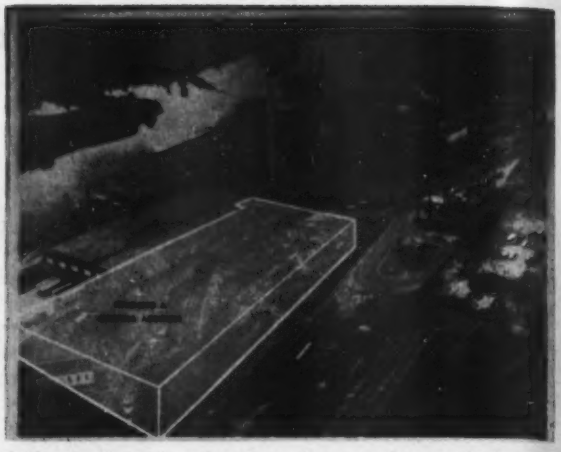
Photo above shows new feed water treatment plant four stories high and part of boiler house. Unit supplies pure water to three steam boilers and capable of treating 190,000 lbs. of water per hour.

Close up of new roof construction. When completed, will double the height of present structure. Roof penthouse quarters ventilation fans and added inside room height provides for ventilation ducts, lighting systems and efficient operation of two maintenance cranes.

Entrance to new starch building where cooking and storage tanks will be located.

New rotor unit awaits installation into new pulpmaster for new paper machine.

New steam boiler on its way into new section of boiler house at Wausau. Now "on the line" to be used primarily to supply power for the new paper machine. Unit was designed to produce over 50,000 lbs. of steam per hour.



Outline in photo shows location and size of planned addition of a greater finishing and shipping building. Over 100,000 sq. ft. added will more than double present capacity. This will give facilities for loading 11 freight cars under cover.

New Representatives for Eaton

The Cleveland Worm & Gear Divisions have announced the appointment of new engineering sales representatives in Cleveland, Pittsburgh and Philadelphia to replace the Dingle-Clark Co. which recently announced its retirement from the agency business.

In Cleveland, the R. V. Robinson Co. will become the exclusive engineering sales representative in this area.

In Pittsburgh, the J. P. Murray Co. will become the exclusive engineering sales representative in this area.

In Philadelphia, W. M. Stilwell formed a sales agency under his name as an outgrowth of the former Dingle-Clark office to represent the company in this area.

Wisconsin Tissue Plans Construction at Menasha

Plans for the immediate construction of a new building to house its printed specialty products division, has been announced by Wisconsin Tissue Mills. The new plant will provide in excess of 30,000 sq. ft. of additional converting space, and will be constructed on the company property located in Menasha, Wis.

Foreign Subsidiary Formed by Mead

H. E. Whitaker, chairman of the board for Mead Corp., has announced that the company has established a foreign subsidiary.

The new subsidiary is to be known as Mead S.A. (Societe Anonyme) has been formed as a wholly owned subsidiary to centralize the corporation's international operations. Its headquarters will be established initially in Zurich, Switzerland.

Harry R. Slack IV will coordinate the new Mead enterprise and will take up residence in Zurich in the near future. Prior to this new assignment, Slack had divided his activities between sales to national magazine accounts and merchandise liaison work for Mead Papers Inc. from the Dayton headquarters office for the past three years.

Keyes Fibre Adds New Production Equipment And Introduces Crumb Method

New equipment comprising of additional molding machines, new methods of stock handling, a new boiler, raw material storage, and enlarged grinding and stock preparation facilities will be installed at the Shawmut and Waterville, Maine, plants of Keyes Fibre Co.

A major change in the company's manufacturing production is being made with the installation of the new crumb method of dewatering and shipping pulp by rail from its groundwood pulp mill at Shawmut to the company's manufacturing facilities in Waterville.

Using this new crumb method, groundwood will be thickened through a combination of a Dorr-Oliver thickener and P & L disk presses, to 35 per cent A.D. It is then passed over a Weightometer which automatically weighs the pulp and proportions the additives. It is next conveyed to an E. D. Jones Vertiflex mixer which crumbs the stock, mixes additives as desired and delivers it to a Sprout-Waldron blower system for carloading. The entire operation is handled by one man through push button controls.

Pulp will be removed by vacuum at the Waterville converting plant and stored in silos. High-pressure water nozzles slush the stock from the silos and it is then pumped through a consistency regulator to an agitated buffer tank for further defibering. Finally it is automatically sized and passed through a second consistency regulator to the molding machine heavy stock tanks.

The final step in the current program will be the addition of grinding capacity at Shawmut, which will increase the daily production to 120 A.D. Daily tonnage at the Waterville plant will also be increased this year with the installation of two new machines for Chinet products and one for Savaday products.

Allied Chemical Starts Up New Alum Plant

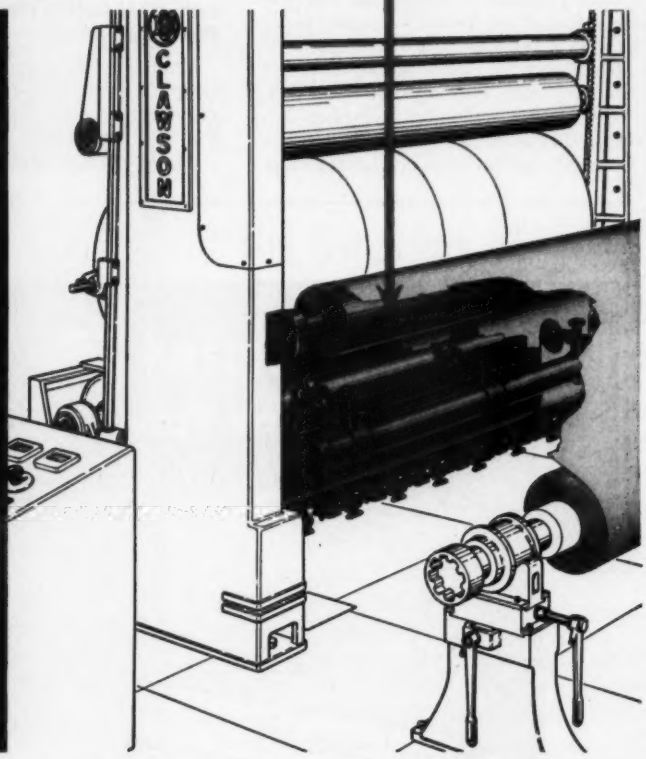
The new liquid aluminum sulfate plant, located near Los Angeles, has been opened by Allied Chemical's General Chemical Division.

This new plant is General Chemical's 29th facility producing dry or liquid "alum" in the United States and Canada. The division has four other West Coast "alum" plants at Port Chicago, Calif., and at Tacoma, Vancouver and Kennewick, Wash.

Volney Felt Orders Six Shartle Beaters

Volney Felt Mills, a producer of roofing felt and other building papers, recently placed an order with the Black-Clawson Co. for six Shartle rag

Hi-Speed Rollflyte Winders *with new* Verti-Shear*



*Verti-Shear... a new vertical slitting method designed to make Rollflyte winders more productive and easier to operate, has several obvious advantages.

- Shorter draw from point of slit to point of wind
- Slitters and adjustable spreader bar are readily accessible to the operator
- Minimum downtime for maintenance
- Standard commercial parts—bearings, sprockets, air cylinders, etc.

Rollflyte mill winders have heavy box framing that dampens vibration and adds stability. Rotating members are properly sized for minimum deflection and balanced for speeds in excess of operating speeds.

These modern winders can be equipped with roll ejector, air-operated rewind shaft, lowering table, rewind shaft core holder and puller, control console and constant tension control.

Furnished in eight sizes with rewind capacities from 48" to 84" dia., trim width to suit your machine. Write for Bulletin 23-DM

The Black-Clawson Company
Slitter-Winder Dept., Fulton, N. Y.

Another Advanced Engineering Design

BLACK-CLAWSON

For more data circle 127 on Post Card

beaters to be installed in two Volney mills.

Although today's closed, continuous stock preparation systems have largely eliminated the beater in many paper mills, it remains an essential piece of equipment for preparing rag fibers for roofing and flooring felt furnishes. The unique hydrating and fiber cutting action of a beater roll is indispensible in this area of papermaking.

Each of the six beaters has a capacity of 1200 lbs. of stock and is equipped with rolls measuring 52 by 48 in. Three beaters will be installed in the Volney mill in compton, Calif., and three in the mill in Emmaus, Penn.

Columbia Builds New Plant to Double Capacity

Columbia Corrugated Container Corp. of Hicksville, L. I., has broken ground for a new plant in Syosset, Town of Oyster Bay, L. I.

Plans for the new structure include the housing for offices, warehouse and factory and should be completed in about 10 months.

Paul Serwitz, president of Columbia, stated that in the initial stages, his company will use about 2,000 tons of paper per month. This will build in a short time to 7,000 to 8,000 tons per month and will double the company's present manufacturing capacity.

A. E. Staley Operating New Pilot Plant

A miniature starch processing plant, built to scale of full-size production equipment, has been built by A. E. Staley Mfg. Co.

The new pilot facility will speed development of modified starch products for the paper, textile and other industries; and will develop process data on research laboratory findings and produce semi-commercial quantities of new starch products for market development use.

New Trimmer at Brown Co.

The Paper Division of Brown Co., has installed a new, advanced-design sheet trimmer. The unit is complete with automatic handling equipment. It will more than double the company's sheeting capacity.

Installation of this trimmer will mark the final step in a modernization program in the mill's finishing room. The new facilities will enable Brown Co. to ship stock orders within 24 hrs. and make orders within seven to ten days.

Nopco Chemical Installs New Laboratories

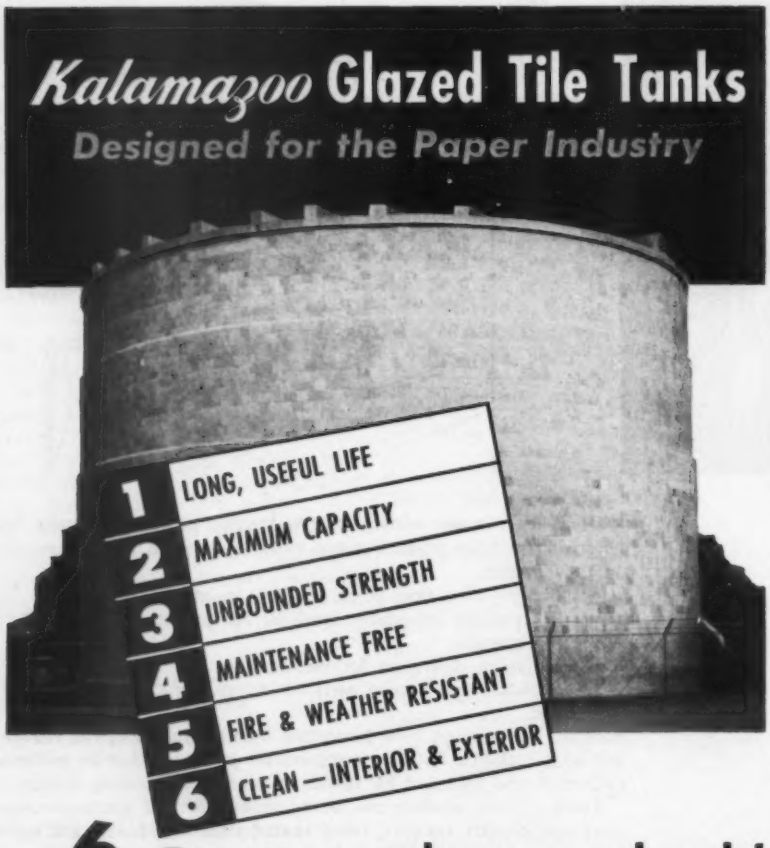
Nopco Chemical Co., in line with its overall expansion program, has installed new laboratories for its Industrial and Fine Chemicals Division.

The paper laboratory is included in the new facilities. This lab is equipped for operations which can simulate pulping, stock preparation, paper making and coating operations. Special equipment is capable of reproducing mill system turbulance for foam control studies and general evaluations of Nopco additives.

Tests are run on customers samples to determine ways and means of improving quality through chemical application and to solve specific problems for particular companies.

New Address for Rust Engineering

The New York office of Rust Engineering has been located in the Lincoln Building on 42nd St. for over 20



6 Reasons why you should give us a call on your next job

Kalamazoo's steel reinforced glazed tile tanks are designed and erected by experts. If you have a specialized building problem it will pay you early dividends to call us now.

TILE TANK DIVISION

Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

For more data circle 128 on Post Card

*Idea submitted by James H. Ozias, Jr., Oxford Paper Co., West Carrollton, Ohio Photo by: Kaufman & Fabry

The Mission of San Juan de Capistrano near Los Angeles, to which the swallows have returned year after year — for centuries.

HAM FELTZ says:

"The Swallows of Capistrano remind me of HAMILTON Felts... they're dependable too!"

"Just as you can count on the return of the swallows to Capistrano, you can count on Hamilton Felts for consistent, high quality performance and economical long life — order after order".

"Yes — not only have hundreds of papermakers proved Hamilton Felts best for their needs, they know they can reorder — by mail, telegraph or phone — and count on the same custom made, pre-shrunk, pre-sized, high quality Hamilton Felt time, after time, after time."

If one of our present 300 proven styles won't solve *your* specific problem, you can depend on us to design a Hamilton Felt that will. Just write us to contact your Hamilton Felts Service Salesman.

*WIN... *A NEW Shakespeare Spincast Fishing Outfit!*

"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each month, the idea from a papermaker that we use wins a new 1960 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. *Every U.S. papermaker entrant* receives a famous Rex Spoon fishing lure—FREE. Send me your suggestion—today. Ham Feltz, 612 First National Bank Bldg., Cincinnati 2, Ohio."

YOU CAN'T BEAT

Hamilton

FELTS

SHULER & BENNINGHOFEN, HAMILTON, OHIO

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years. As of August 15, the new address of the New York office will be in Room 1910, 9 Rockefeller Plaza, New York 20, N.Y.

C. W. Churchill Jr. is Rust's representative in charge of the New York office and sales in the New England States.

Newsprint Machine For MacMillan

MacMillan, Bloedel & Powell River Ltd. has announced that it will spend $24 million to add a newsprint machine at its Port Aberni, B.C., plant.

J. V. Clyne, chairman and chief executive officer stated that the company's existing capacity is sufficient to meet normal market demand until 1964 or 1965. The new machine is being added to anticipate any increased demand.

Completion of the unit is scheduled for 1963.

$3-million Technical Center for St. Regis

In order to make more effective use of new technology in the company's operations and to implement continuing programs of diversification and growth, St. Regis Paper Co. will begin late this year to construct a new $3-million technical center.

Located on a 60-acre site, the Center will be comprised of offices, laboratories, a technical library, cafeteria, and supporting services. It will accommodate about 180 persons. In addition to the research and development department, technical services and control and technical planning departments will be located at the Center. Programs to be undertaken will relate to materials utilization, printing papers; kraft pulp, paper and board; bags, packaging, plastics and other products.

New Offices for Combustion Engineering

The general offices of Combustion Engineering Inc., which have been located in New York for more than 45 years (35 years in the Combustion Engineering Building at 200 Madison Ave.), have been transferred to Windsor, Conn.

Mailing address at the new corporate general offices is: Combustion Engineering Inc., Windsor, Conn. Tel: Murdock 8-1911.

Consoweld Operates New Laminating Press

A plastic laminating press, said to be the world's largest, is now being operated at the Consoweld Corp. in Wisconsin Rapids, Wis. The unit is capable of turning out 180,000 sq. ft. daily.

Stanton W. Mead, president of Consoweld Corp. and of Consolidated Water Power & Paper Co. (the parent company), stated: "We are adding this modern, new press to give Consoweld the productive capacity we believe will be necessary to meet the anticipated growth in the laminated plastics industry".

No. 3 Machine Now Operating For International

International Paper Co. has announced that the third paper machine installed at the company's Pine Bluff Mill is now in operation.

Manufactured by Beloit Iron Works, the new machine is equipped to manufacture newsprint and telephone directory paper to meet the demand for these grades of paper in the South and Southwest.

Additions to the groundwood mill, the pulp mill, etc., were also made to accommodate the needs of this new machine. The new machine room is located adjacent to and adjoining the building which houses the two original machines which began operation in

CIBA

"PAPER-PROVED" FOR BRIGHTER, WHITER WHITE

DIRECT
PURE
BLUE
P-2BR Conc.

Here is a new, effective, and economical answer to the problem of producing paper with brilliant whiteness. Direct Pure Blue P-2BR Conc. yields purer, brighter whites at savings up to 50%. This dye is meeting prescribed performance in field testing. Easy-to-work and providing ideal fastness properties, Direct Pure Blue P-2BR Conc. is well worth investigating.

Your inquiries are invited on CIBA "Paper-Proved" technical information, samples and color matching.

CIBA Company Inc.,
Paper Chemicals Department
Fair Lawn, New Jersey
For more data circle 130 on Post Card

June of 1958. These two machines produce newsprint and bleached kraft board.

First Canadian-Made Unit Shipped by Bauer Bros.

A highlight of the expansion program at Bauer Bros. Co. (Canada) Ltd., Brantford, Ont. was the company's recent completion and shipment of the first Canadian-made, Bauer 40-in., double-revolving disc refiner. This first unit off the assembly rails was part of an order of ten such refiners for MacMillan, Bloedel & Power River Co. The refiners will be used in the Powell River, B.C. mill.

In addition to improving facilities to the point where equipment can be completely assembled, over 5,000 sq. ft. of manufacturing space have been added to the four-year-old plant, along with new equipment.

Continental Can Opens New Jersey Plant

A new fibre drum manufacturing plant has been opened by Continental Can Co. in Carteret, N.J. This is the seventh fibre drum installation for Continental Can.

The plant will produce two kinds of fibre drums for dry products — the Leverpak and the Stapak. The Leverpak is used as a container for products such as plastic molding compounds, chemicals, detergents, pharmaceuticals, dyestuffs, pigments and colors, foods such as soluble coffee and powdered milk, abrasives, insecticides, metal parts and metal products. The Stapak is used for products such as detergents, foodstuffs and metal stampings.

Reichhold Plans Monomer Plant

Reichold Chemicals Inc. has made plans to produce vinyl acetate monomer under a license agreement which has been signed with Wacker Chemie G.M.B.H. of Munich, Germany.

The chemical will be produced at a new plant to be built by the company. Location of this plant has not been announced. The chemical will be produced at an initial capacity of 50 million lbs., with planned expansion to 100 million lbs. annually.

Goulds Pumps Establishes Corporation

A separate corporation to be known as Goulds Pumps International Inc., has been established by Goulds Pumps Inc. The new corporation will handle all export sales of the company.

The company has asked that all inquiries, correspondence, etc., covering the sale or usage of its product in foreign fields be directed to the new corporation's office—Goulds Pumps International Inc., 260 Madison Ave., New York 16, N.Y.

Union Tank Car Enters European Enterprise

Union Tank Car Co. has announced that it is joining with two of Belgium's leading plate fabricating concerns in a new enterprise which is expected to play a major part in the metal fabrication industry of the European Common Market.

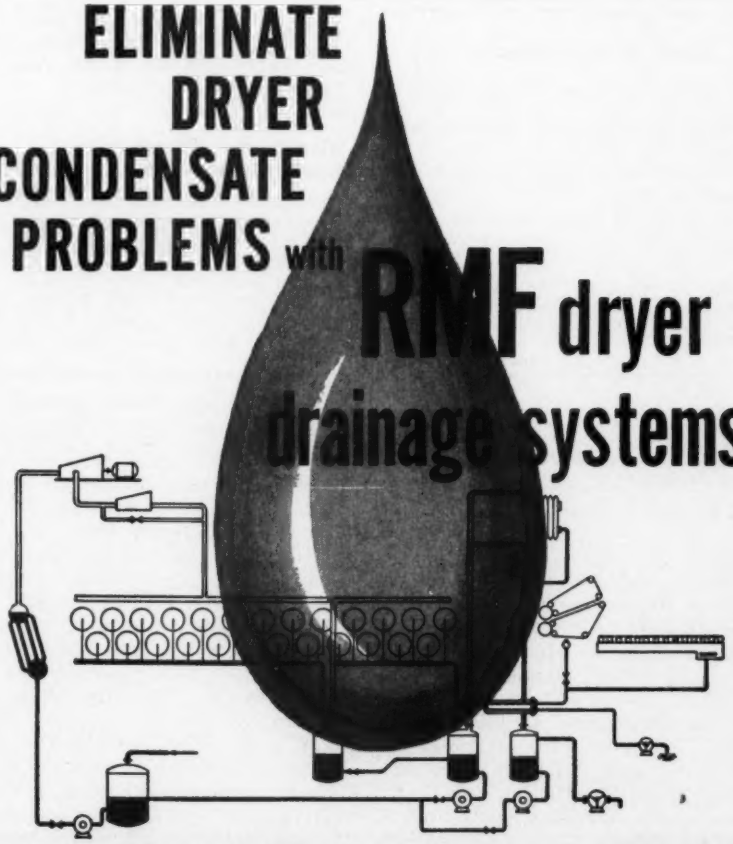
Union's new affiliate, to be known as Compagnie Graver, S.A., will offer the full line of conservation equipment and other products developed by the Graver Tank & Mfg. Co., a division of Union Tank Car Co.

St. Marys Orders Beloit Paper Machine

A new 236-in. Beloit paper machine has been ordered for installation at the St. Marys Kraft Corp. of St. Marys, Ga.

The new machine (third for the plant) will be designed to permit the manufacture of linerboard and

ELIMINATE DRYER CONDENSATE PROBLEMS with RMF dryer drainage systems



• Increase Dryer Capacity • More Uniform Drying
• Higher Production • Prevent Reject Sheet

Our Dryer Drainage Systems will effectively eliminate your water condensate problems. Drying capacity is substantially increased and you get more effective drying at lower temperatures. In addition, RMF Systems result in more uniform drying across the sheet, assuring automatically graduated dryer temperatures. This lessens shrinkage, cracking, curling, wet streaks and hardening.

Send for Bulletin.

RMF ROSS MIDWEST FULTON
A Division of Midland-Ross Corporation
Box 846, Dayton, Ohio

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For more data circle 132 on Post Card

News of the Industry . . .

bleached food package board at some future date.

In addition to the paper machine, a new 51,000-sq.-ft. building will be constructed to house the refining and chemical additive equipment.

St. Mary's only recently finished another multi-million-dollar expansion — the establishment of a paper converting plant for the manufacture of finished boxes and other items. The plant is located on Cumberland Sound, not far from the Atlantic Ocean.

Brunswick To Spend $35 Million on Expansion

Brunswick Pulp & Paper Co. of Brunswick, Ga., has made plans to spend $35 million on an expansion program that will nearly double the size of the Brunswick, Ga., plant, and has included plans for the plant's first paper-making facilities.

E. J. Gayner, president of Brunswick, stated that the expansion is subject to the approval of the mill owners — the Mead Corp. of Brunswick., Ga., and the Scott Paper Co. of Chester, Pa.

The parent firms now take all of the pulp (high-brightness bleached sulfate pulp) and use it for printing papers and sanitary tissues.

Manchester Names New Representative

Manchester Machine Co. of Middletown, Ohio, has named Stevens Mill Supply Co. of Port Hueneme, Calif., as its West Coast representative for engineering and service. Stevens will service Manchester customers in California, Arizona, Nevada and Utah.

Georgia-Pacific Starts Up New Kraft Machine

Operation of a new Black-Clawson kraft paper machine has been reported by the officials of Georgia-Pacific Paper Co., Toledo, Ore.

The new machine was installed alongside a 262-in., Black-Clawson, kraft linerboard machine installed in 1957. Together, the two machines provide the mill with a total production of 650 tons of paper per 24 hrs.

The unit is a Hydroflyte cantilever fourdrinier, 175 in. wide and was built by the Paper Machine Division of Black-Clawson in Watertown, N.Y. Equipped with two suction presses, breaker stack, size press, 58, 60-in. dryers and one 8-roll calender stack of open-side design, the unit is capable of producing 200 tons per day of bag paper.

Corporation Changes

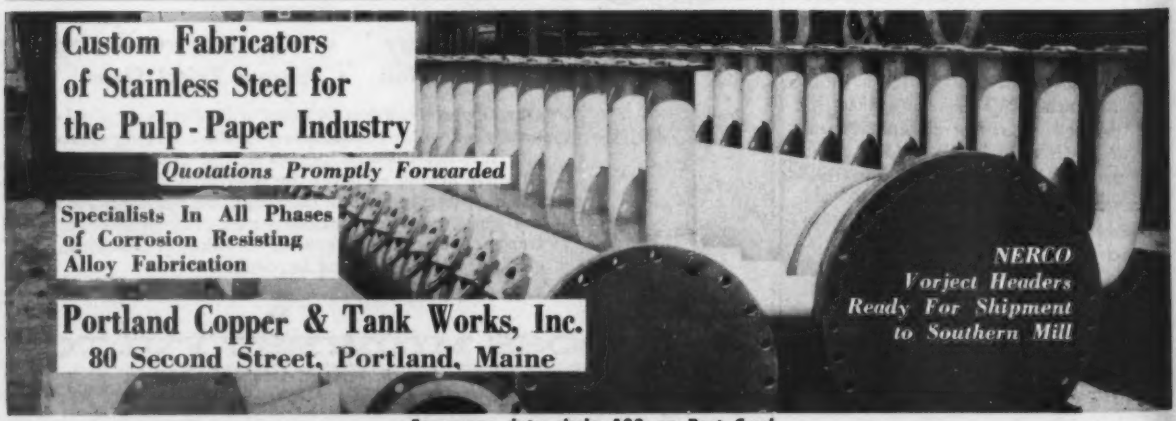
Sorg Paper Co. has acquired the capital stock of **Groff Paper Co.** Groff, a 40-year-old firm, has been one of Sorg's customers for a number of years, converting facial tissue into napkins, guest towels, etc.

• • •

St. Joe Paper Co. has announced the purchase of **Columbia Container** of Baltimore, Md., and an affiliate, the **Columbia Container Corp.** of **Virginia.** This acquisition brings the total to 11 plants now being operated by St. Joe Paper.

• • •

Chemical Linings Inc. has been merged with **Atlas Mineral Products Co.** Chemical Linings will be moved from 156 Stone St., Watertown, N.Y., to Mertztown, Penn., where it will operate as an Atlas Division. Both Atlas and Chemical Linings are now wholly-owned subsidiaries of the Electric Storage Battery Co. of Philadelphia, Penn.



For more data circle 133 on Post Card

Current Comments . . .

(Continued from page 425)

St. Croix Paper Co. — Net income for 26 weeks ended July 3, $282,227; a year ago, $494,799.

St. Regis Paper Co. — Reduced prices for multiwall bags and kraft paper brought the company's six-months income down to $11,755,689 from the 1959 net of $14,128,369.

Financial Notes

The general downward trend of securities in the New York market during late July had a comparable falling off in paper mill issues. Preferred stocks were stronger on the average than the more sensitive common stocks.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	August 10, 1960	July 11, 1960
American Can	38¼	39⅜
Same Pref.	38⅞	37
Celotex	22½	22⅝
Same Pref.	* 17-17⅛	* 17¼-18
Certain-Teed	12	11¾
Champion P & F	—	37¾
Same Pref.	90¼	* 90½-93
Chesapeake of Va.	* 34¼-34¾	* 33½-34
Container	22¼	24⅛
Same Pref.	* 89-90	89
Continental Can	35½	38¾
Same Pref.	80	79¼
Crown Zellerbach	42¾	44¼
Same Pref.	91	92½
Diamond National	32½	37½
Same Pref.	30⅞	30
Federal Paperboard	36	36¼
Same Pref.	21	21
Fibre Paper Board	31	33½
Great Northern	42¾	44½
Hammermill	28½	28¾
International	97½	100
Same Pref.	* 93-94	* 91¾-92
Kimberly-Clark	76	76½
KVP Sutherland	30	29¾
McAndrews & Forbes	30¼	28¼
Masonite	29	31½
Mead Corp.	33	36
Same Pref.	* 85⅛-88	86¼
Minn. & Ont.	29	30
Nat. Vulc. Fib.	22¼	25⅛
Oxford Paper	27	27⅞
Same Pref.	93	90⅝
Rayonier	16⅞	17⅝
Riegel Paper	31½	33¾
St. Regis	35	38
Same Pref.	* 92½-93	* 91½-93
Scott	85⅞	88⅝
Same $4 Pref.	89⅛	90
Same $3.40 Pref.	76	* 75-76
Sealright	34¼	36⅞
Standard Packaging	28⅜	31⅞
Same $1.60 Pref.	85¼	* 95-105
Same $1.20 Pref.	32¾	37½
Same 6% Pref.	—	36¾
Union Bag-Camp	34⅛	33⅞
United Bd. & Cart.	—	* 23-23¾
U. S. Gypsum	99	112
Same Pref.	159	*152-153¾
West Va. P. & P.	39	44⅜
Same Pref.	* 93¾-97½	96½

New York Stock Exchange — Bonds

Champion P & F Co. 4½%	109	107¼
Champion P & F 3¾%	88	91
Champion P & F Co. 3¼%	90½	—
Diamond Gardner 4%	97	—
Kimberly Clark 3%	90½	91
Oxford 4¾%	106¼	107½
Scott 3%	109⅜	114

American Stock Exchange — Stocks

Allied Paper	13⅜	15¼
American Writing	29	29⅜
Brown Co.	14	15⅜
Puget Sound P & T	22¾	24

*Closing Bid and Asked Prices

Coming Events

TAPPI

October 6-7 — 5th Deinking Conference, Conway Hotel, Appleton, Wis.

October 10-13 — 10th Corrugated Containers Conference, sponsored jointly by CPPA and TAPPI, Royal York Hotel, Toronto, Ontario.

October 17-19 — 15th Plastics-Paper Conference, Hotel Syracuse, Syracuse, N.Y.

October 23-27 — 15th Engineering Conference, Robert Meyer Hotel, Jacksonville, Fla.

PIMA

September 22-24 — Northeastern Division Poland Spring House, Poland Springs, Maine.

September 22-24 — Northwestern Division, (Fall Meeting), Northland Hotel, Green Bay, Wis.

September 30 - October 1 — Pennsylvania-New Jersey-Delaware Division (Fall Meeting), Pocono Manor Hotel, Pocono Manor, Penn.

October 7-8 — Connecticut Valley Division (Joint Fall Meeting with N.E. TAPPI), Hotel Northampton, Northampton, Mass.

October 12-14 — Southern Southeastern Divisions (Joint Fall Meeting), Williamsburg Inn and Williamsburg Lodge, Williamsburg, Va.

OTHER MEETINGS

September 18-21 — National Paper Trade Association Convention and Exhibit, Chicago.

September 19 — SAPI Annual Fall Luncheon, Conrad-Hilton Hotel, Chicago.

September 26-30 — 15th Annual Meeting, Instrument Society of America, New York Coliseum, New York, N.Y.

October 17-21 — 48th Annual National Safety Congress, Pick-Congress, Chicago 11, Ill.

October 17-31 — Conference on Pulp and Paper Development in Asia and Far East, Tokyo.

October 19 — Fall Meeting, Great Lakes Section Forest Products Research Society, Manger Rowe Hotel, Grand Rapids, Mich.

October 23-27 — Canadian Institute of Forestry and the Corporation of Forest Engineers of the Province of Quebec — joint forestry convention in Quebec City.

October 26-28 — Third Cellulose Conference, Cellulose Research Institute, State University College of Forestry, Syracuse, N.Y.

November 1-3 — Material Handling Institute Central States Show, Kentucky Fair & Exposition Center, Louisville, Ky.

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NAMES *in the* NEWS

Champion Paper & Fibre Co.

A. M. Fairbrother has retired as vice president of the company's Carolina Division. He has been with Champion for 25 years and has headed the Carolina Division since 1958.

Willis Kirkpatrick has been promoted from assistant division manager to acting division manager. He has been with Champion for 36 years, having started in 1924 as a painter.

Dana Pratt, director of export sales, has retired after serving with the company for over 23 years. He was also president of Champion Paper Export Corp. and Champion Paper Corp., S. A. Pratt has been active in the NPTA and the APPA.

Marshall Coates has been promoted to shift foreman of the No. 2 Mill Beater Unit. He has been associated with this mill since 1929 and will now supervise its activities.

Institute of Paper Chemistry

Dr. Norman S. Thompson has been appointed research associate in the engineering and technology section. He will participate in the academic program and will undertake research dealing largely with the mechanisms of pulping and bleaching reactions. Thompson is a member of the American Chemical Society and TAPPI, and has been associated with Rayonier Inc. for the past seven years.

Allied Chemical Corp.

Ronald Lovatt has been named as manager of the Calcium Chloride section in the company's New York office of the Solvay Process Division. He will succeed H. R. Smith.

H. R. Smith has been appointed assistant to the manager of the Syracuse, N.Y., sales branch and will be responsible for the sale of calcium chloride, limestone and salt in the state of New York.

John C. Fedoruk has been appointed as technical director of Allied Chemical's General Chemical Division. Prior to this appointment, he was serving as manager of the company's development laboratory at Baton Rouge, La., and as research chemist at its plant in North Claymont, Del. He will succeed Dr. Howard H. Hurmence.

Dr. Howard H. Hurmence was recently named as assistant director of research and development for the corporation.

West Virginia Pulp & Paper Co.

Harold E. Miller has retired after 43 years of service with the company. He has developed scores of young engineers and administrators after interviews with them in 30 different colleges and 12 European nations.

His technical achievements include the largest lime recovery kiln in the paper industry, the largest efficient rotary furnaces for incineration of waste black liquor and a new process of secondary causticizing which is still considered modern to the industry.

H. E. Miller

J. E. Minch Sr.

Howard Paper Mill Inc.

John E. Minch Sr. has been elected president of Howard to succeed W. B. Zimmerman who was drowned in a boating accident July 20. At the same time, the Howard board of directors named Archibald Carswell, executive vice president of St. Regis, to fill the board vacancy caused by the death of Zimmerman. Minch is a member of the firm's board of directors and executive committee.

Bauer Bros. Co.

The following four men have recently been elected as vice presidents for Bauer Bros.: Edward L. Rastatter, sales; James E. Irvine, engineering; Ronald G. Goodwin, pulping development; and Thomas T. Cowhey, general manager of Bauer Bros. Co. (Canada) Ltd.

Richard R. Dill has been named manager of sales, industrial equipment and Anton J. Hortsman was appointed assistant to the administrative vice president.

Chicago Bridge & Iron Co.

Donald A. Leach, a vice president and regional sales manager retired on July 1 after nearly 40 years of service with the company. He will remain a director of the firm.

George S. Trees will succeed Leach as manager of CB&I's central sales region and Chicago district sales office. He will move to Chicago after

Milprint Inc.

Fred M. Stefan has been elected president and a director of Milprint. He was previously executive vice president of the Marbon Chemical Div. of Borg-Warner Corp.

T. H. Lange has been named a part-time consultant to the traffic dept., and has relinquished the post of general traffic manager, a position he has held for 22 years.

Russell Dieffenbach has been named general manager of the rotogravure carton plant in Downingtown, Pa. He was formerly a national account supervisor for a large packaging firm, and has spent six years in the production of folding cartons, sales service and estimating work.

T. H. Lange

F. M. Stefan

R. Dieffenbach

Hop On The Jenkins' METLKOR Bandwagon

You'll have plenty of company, for Paper Mill men everywhere are using Jenkins' METLKOR brushes for every paper brushing application. They are built better, to perform better, and last longer.

Jenkins' METLKOR Paper Polishing Brush.

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Names in the News . . .

five years as manager of the Pittsburgh district sales office. He is also a director of the company.

J. W. Hoerner has been appointed as manager of the Pittsburgh district sales office. He previously had been a contracting engineer in the Atlanta district sales office since 1947.

Rayonier Inc.

A. G. McArthur has retired as manager of the Southeast Timber Division of Rayonier. He is succeeded by Ernest P. Davis who has been operating manager of the division. McArthur, however, will remain available to Rayonier as a consultant on timberland matters.

Clinton Corn Processing Co.

R. C. Rau has been appointed to the position of sales manager of Primary Products. He will have his headquarters in Clinton, Iowa.

C. F. Cline Jr. has been named to succeed Rau as Southern Division general sales manager and Southern Division headquarters has been transferred to Greenville, S. C.

Russell L. Kair has been appointed as district manager of the Atlanta district.

Boyce L. Estes has been appointed district manager of textile sales, covering the states of Georgia, Alabama, Mississippi and Tennessee with headquarters at Atlanta, Ga.

General Aniline & Film Corp.

William G. Sumner has been promoted to sales engineer at the Chattanooga, Tenn., branch office of the Dyestuff & Chemical Division. He will be concerned with the application of the firm's chemicals in textile, paper and leather industries in that territory.

Huyck Felt Co.

George H. Gill III has been promoted to the position of assistant sales manager. He has been with the company for almost 10 years as field service and sales engineer. Gill will serve paper mills throughout the country in this new capacity.

Ralph N. Prince, who has been associated with the paper industry for almost 25 years, will replace Gill as sales engineer for Ohio and portions of Indiana, Pennsylvania, West Virginia, Kentucky and Tennessee.

H. Clark Lind has recently been appointed research engineer. He will work closely with papermakers to develop improved constructions and finishing techniques.

Conoflow Corp.

Nicholas R. Delaney has been appointed treasurer. Prior to his new appointment, he served the company as assistant treasurer and controller since 1954.

Fred H. Sandritter has been appointed assistant advertising manager. He joined the company in 1955 as advertising department assistant and was named supervisor of the direct mail section in 1959, a position he held until his present appointment.

Raymond F. Neill Jr. has been appointed as purchasing agent. Prior to his new position, he had been buyer since 1958.

Shuler & Benninghofen

Paul W. Thompson has been appointed national sales manager for Hamilton Felts by Shuler & Benninghofen, which is now celebrating its 102nd year of service to the papermaking industry. Thompson had been associated with the company for many years in sales and service. In his new position, he will be responsible for improving on an established standard of service to every papermaking area in the United States. He will make his home office in Hamilton, Ohio.

Waterbury & Sons Co.

Stephen J. Elkins has been appointed as sales representative for the New York State and Northeastern New Jersey area. Prior to assuming his sales activities, Elkins had completed an intensive training period at the Waterbury mill which covered all phases of felt production.

S. J. Elkins

J. F. Howell

Wisconsin Wire Works

George Clayton, who previously represented the New York area for the company, has been re-assigned to Virginia, West Virginia, Pennsylvania, New Jersey, Delaware and Maryland.

John F. Howell, a newly appointed representative, replaces Clayton in

New York state. This change in field staff is expected to increase the company's depth of service in both the New York and Virginia areas.

Hammermill Paper Co.

Albert F. Duval has been elected as vice president. He was previously president and director of U. S. Envelope Co. until his resignation on June 17.

Victor S. Oakes has been appointed as division manager of the Oswego Division. He will be responsible for management of the entire Oswego Division.

William J. Bitting has been appointed as personnel manager of the Oswego Division. His appointment becomes effective on September 1.

Nekoosa-Edwards Paper Co.

Earl L. Wellner, a veteran papermaker in the Port Edwards mill for 34 years, has been named assistant to the paper mill superintendent of the Potsdam, N.Y., mill of Nekoosa-Edwards Paper Co. A resident of Port Edwards all his life, Wellner left for New York to assume his new duties.

Black-Clawson Co.

Carl C. Landegger has been appointed as executive vice president of the company. A vice president of the company, prior to his new appointment, Landegger served in several management and administrative positions with divisions of the company. In his new position, he will coordinate management of the company's facilities from the corporate offices in New York.

W. R. Grace & Co.

Gilbert J. Boulton of Raymond, N. H., has been appointed manufacturer's representative in Maine, New Hampshire and Vermont for the "Endura" and Darex" impregnated fiber products of the Dewey & Almy Chemical Division of W. R. Grace & Co. Boulton will make his headquarters in Raymond.

A. E. Staley Mfg. Co.

Dr. William P. Hagenbach is now director of engineering research. For the past nine years he has been in engineering research with the DuPont Co., where he headed various development engineering projects. Dr. Hagenbach will succeed Dr. Ralph E. Fredrickson, who resigned after 18 years with Staley development engineering and had headed this activity since 1955.

Ellsworth E. Kimmel has been named director of the industrial market development department.

Constantine J. Ballos was named to head the paper industry section of the industrial market development department.

Babcock & Wilcox

M. E. Ziegenhagen has been appointed as director of advertising and public relations. He will be responsible at the corporate level for the direction and centralized coordination of advertising and publicity, and will serve all company divisions and subsidiaries in these functions.

John A. Menster has been named manager of welded tubing sales for the company's Tubular Products Division. He will maintain his headquarters at the Alliance plant of the Tubular Products Division. Menster succeeds Leon E. Jeanneret who has retired.

R. P. Stuntz has been named manager of field sales. He was formerly assistant sales manager and will now assume direction of the refractories division's district sales personnel, agents, distributors and dealers.

L. D. Christie Jr., formerly assistant to the division's technical director, was named product manager, technical sales. He will program and direct field

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WHY? Because unloading wood chips via a "Kewanee" is the most logical way to handle them! A "Kewanee" will simplify and systemize your operations—and, start earning money for you the moment it is installed and running!

Here are a few of many more reasons:

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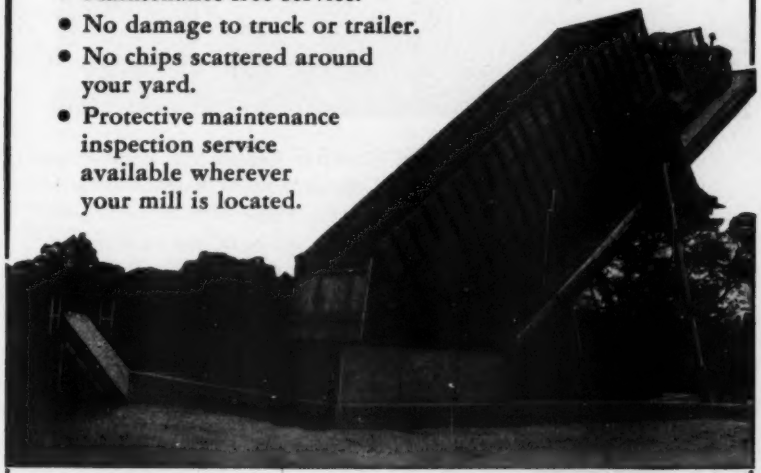
- **No damage to truck or trailer.**
- **No chips scattered around your yard.**
- **Protective maintenance inspection service available wherever your mill is located.**



Above photo shows a 45 ft. "Kewanee" unloading chips into a yard hopper from which they are conveyed by belt to mill storage and/or to digesters. "Kewanee's" are available to suit your conditions, in sizes up to 70 ft., with a 50° angle of tilt. Unloading of any size truck or tractor-trailer is accomplished in a few minutes. Scale-type dumpers are also available.

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Hackensack, N. J.	Tampa, Florida

For more data circle 137 on Post Card

Names in the News . . .

testing, evaluate new products and provide technical services to field sales personnel.

Allied Chemical Corp.

William E. Houghton has been appointed sales manager for basic industrial chemicals produced by the company's General Chemical Division. He has been with the division for 27 years, and will now be responsible for sales of aluminum sulfate, chloride and nitrate solutions, ammonium and potash "alum", a variety of sodium compounds and phosphoric acid.

Houghton was manager of General's Philadelphia sales office for nine years prior to coming to the division's New York headquarters as assistant sales manager in 1959.

Morden Machines Co.

Ivan Kuhns has been appointed sales and service engineer to the company's Southern Region. He will devote a substantial amount of his time to Mordon Pulpers and the introduction of the new Morden Disco-Finer. This machine is said to be especially well adapted to the hugh mills in the southland. Kuhns will make his headquarters in Atlanta, Ga.

Standard Packaging Corp.

Edward W. Keith has been appointed as superintendent of the sulfate pulp mill at the Lincoln, Maine mill of the Eastern Fine Paper & Pulp Division.

Wilfred M. McKay has been appointed as general manager of woodlands for the Eastern Fine Paper & Pulp Division. He will succeed D. B. Demeritt, who has resigned from the Eastern Division so as to devote full time to his responsibilities with the Dead River Co., of which he is vice president and director.

Marathon Southern Corp.

Benjamin K. Guenther will be superintendent of Marathon Southern Corp.'s new board mill which is scheduled for start-up operations in the near future.

John Fulkerson, who has served as assistant superintendent in the paper mill for more than a year, will be assistant superintendent in the board mill.

William Woods will replace Fulkerson as paper mill assistant superintendent. He was formerly shift foreman in the paper mill.

Don Minsloff, former paper mill technician at the Menominee plant, has been named as coating superintendent.

Nalco Chemical Co.

John B. Cruell has been advanced to manager of the Southern California district for the Industrial Division of Nalco. He was formerly area manager of Nalco's New York office. He will replace J. T. Nicholson, who has resigned.

John H. Gallager, service representative in Nalco's Eastern district, has been promoted to manager of the New York office and will succeed Cruell.

Graham Paper Co.

E. D. Cornelison, Salt Lake City representative, retired August 15, 1960. His retirement brought to a close 51 years in the paper industry, the last 38 with Graham. He will be succeeded by Audrian D. Dutler.

Albany Felt Co.

Thomas A. Burke has been appointed sales engineer to take over the

Automatic HURLETRON Caliper and Weight Control... assures a New Standard of Quality for Paperboard-Makers

Under the watchful eyes of Hurletron Caliper and Weight Control, fluctuations at the wet end of the paperboard machine are automatically held to *plus or minus one point.* This control system continuously inspects the paper web to detect out-of-caliper conditions or variations in basis weight, and it instantly and *automatically* corrects for irregularities as soon as a trend has been established. Hurletron Control also provides a continuous, permanent record of finished caliper at the dry end after the calender stack. In mills across the nation, the Hurletron is producing new economies... new uniformity... new standards of quality in board production! Write for details *today.*

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sales territory of parts of Michigan, Illinois and Indiana. He has held previous positions with Universal Atlas Cement Co. and Narcross Inc.

Wayne P. Harwood has been appointed sales engineer in the territory covering Eastern New York and part of Connecticut. He has held previous positions with Sylvania Electric Co. and Graton & Knight Co.

S. W. Fletcher

P. Goldner

J. O. Ross Engineering

Saxton W. Fletcher has retired as president of J. O. Ross Engineering Division of Midland-Ross Corp. Fletcher joined Ross in 1923.

He is noted for designing air systems in various industries. He has held several positions with the company, including secretary and vice president prior to his election as president in 1944.

Fletcher's duties will now be handled by the executive vice president of Midland-Ross, Chester J. Schmidt.

Paul Goldner has been selected as district manager of the Seattle office for J. O. Ross Engineering Division of Midland-Ross Corp. Goldner previously covered the New York State mills from his New York office. In his new position, Paul will succeed R. W. Grott who has been the Seattle manager since 1956. Grott will move to the New York office as assistant chief engineer for the division.

Kenneth H. Jones has been promoted to New York district sales manager. He was previously in charge of paper mill sales in the New York office and has been with the company since 1939.

David R. Alexander has recently been transferred from the Boston office to the New York office. He will be servicing the New York State paper mills in this capacity.

Fibreboard Paper Products Corp.

William L. Keady has announced his resignation as president of Fibreboard effective August 26. He will continue as a director and will be in charge of the company's foreign operations.

E. W. Carey, vice president of marketing, was elected to succeed Keady. Carey joined the firm in 1957 as vice president of administration and has held his present position since 1959.

Necrology . . .

Louis H. Clark

Louis H. Clark was president of the Famous Paper Box Co. He was born in Russia and came to the United States as a youth to form the paper box concern more than half a century ago.

Wilbur B. Zimmerman

Wilbur B. Zimmerman, president of Howard Paper Mills Inc., drowned July 20 in a boating accident on Lake Erie. Zimmerman was elected vice president when Howard Paper Mills was formed in 1946, and president in 1955. He was past president of the Writing Paper Manufacturers' Association, served as director of the Association of Pulp Consumers and was presently serving on the executive committee of the Sulphite Bond Group of the Writing Paper Manufacturers' Association.

Frank G. French

Frank G. French was president of the French Paper Co., which his grandfather, J. W. French, founded in 1870.

John Paul Ekberg

John Paul Ekberg was director and retired vice president of Chesapeake Corp. of Virginia. Born in Sweden, Ekberg came to the United States in 1907 where he worked in paper mills in New England and Canada. From chief engineer and later production superintendent, Ekberg rose to vice president in 1942.

Cecil F. Dawson

Cecil F. Dawson was former president and board chairman of the Dixie Cup Co. Dawson joined the concern as a saleman in 1914. At his death, he was director of American Can Co. and a consultant to the Dixie Cup Division.

James Good Conley

James Good Conley had been active in the paper industry for 38 years and was general sales manager of Fraser Paper Ltd., until his retirement last year. He served as president of the Groundwood Paper Manufacturers' Association and general chairman of the Sulphite Paper Manufacturers' Association.

Mr. Du
SAYS:
Paper men need special aid I do their clean up chores With chemical cleaners I've got it made I clean felts, equipment and floors.
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SYSTEM CLEANING . . .
using DuBois Ferro-Terj, for safe, non-toxic cleaning of chests, jordans, beaters, etc., circulated through the lines. Gives efficient, thorough cleaning and rinsing. Ask your DuBois Representative about Ferro-Terj and the solution to other cleaning problems.
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Isaac Schrier

Isaac Schrier was a founder and former treasurer of Schrier Bros. Inc. He retired nine years ago. Schrier was also former director of the Merit Paper Co.

John G. Fleming Sr.

John G. Fleming Sr. was vice president and board chairman of Fleming and Sons Inc. He was identified with the paper industry his entire life.

William F. Thiele

William F. Thiele was manager of Power for Consolidated Water Power & Paper Co. and president of Wisconsin River Power Co. since 1950. He also organized the Thiele Kaolin Co. and had been its president since 1946.

Sidney L. Abramson

Sidney L. Abramson was president of Central States Paper & Bag Co. He founded the company in 1920 and has, with his four brothers, headed it ever since.

FOREIGN ABSTRACTS

The Czechoslovakian pulp and paper industry

Since World War II, the commercial output of this country has increased greatly. In 1958, Czechoslovakia produced 100,000 tons of mechanical pulp, 365,000 tons of chemical pulp, and 558,200 tons of paper and board. Despite the fact that this country has 13 million inhabitants, and produces less pulp and paper than does Norway, with its 3.6 million inhabitants, the former country should be able to export some of its pulp products. Pulp and paper researches in Prague and pulp studies in Bratislava are mentioned briefly.

F. A. Abadie-Maumert and R. Nezdara. *Papeterie* **82**, No. 6 387 to 393 (1960). (in French).

Corrosion of carbon steel by black liquor

The corrosion in an evaporator plant was studied and followed over a ten year period, under a variety of conditions. Any visible corrosion was only found when temperatures rose above 115°C. and with liquor concentrations above 30 per cent. Apparently corrosion increased with rising temperatures, and was proportional to the total solids in the liquor passing the steel surface. Corrosive attack increased with increased liquor turbulance, *i.e.* with an increased rate of heat transfer. Even a partial oxidation of the black liquor caused reduction of corrosion. With an increase in the content of iron compounds in the liquor it is possible that there is a decrease in corrosion. The author discusses possibilities of studying black liquor corrosive action on a laboratory scale.

25 references. Emil Venemark. *Svensk Papperstidn.* **63**, 387 to 394 (1960). (in Swedish, with English summary).

Study of two hydrocyclones used for groundwood

These 2 cyclones had capacities of 340 and 2460 liters per min. (respectively), and the investigation entailed the separation of shives from groundwood pulp. A chest was used holding enough pulp to serve the entire study. The effects of shive content, pressure drop, and reject nozzle diameter on the efficiency of cleaning were studied, and mathematical formulations were deduced. The shive content was determined by use of the British Standard Method, which was shown to be highly reproducible.

Apparently the smaller cyclone was the more efficient as a cleaner, and the difference in efficiency was especially noticeable when the shive content was over 0.5 per cent, and when not only shives but bark specks were to be removed. On the other hand the larger cyclone could be operated at maximum efficiency with lower pressure drop and with less reject bleed than could the smaller cyclone. Due to its larger nozzle and its insensitivity to pressure variations, the larger mechanism was less likely to cause variations in quality than was the smaller one. Effects of inject consistency and of temperature were not studied.

Gunnar Gavelin and Lars Sikström. *Svensk Papperstidn.* **63**, 398 to 405 (1960). (in English).

Forced penetration of alkali into wood

Orienting experiments, in which 1 and 4 per cent caustic soda were filtered through sawdust are described briefly. The main purpose of the study however was the penetration of dilute alkaline solutions into previously evacuated cubes of spruce or poplar, one cubic inch in volume, by the use of a hydrostatic pressure of 1000 lb. per sq. in. In some of the experiments the woods were given a coating so that penetration could occur only in a single direction (*i.e* radially) or tangentially. In other instances uncoated cubes were used. Sorption of the alkali in the outer portions of the cube proved to be a major factor in the sodium hydroxide distribution through the wood. Such penetration was not identical with that of the water.

Debarking birchwood chips

The importance of bark removal prior to further processing is reviewed. When wood chips are to be used as the raw materials, it was deemed expedient and profitable to remove the bark *after* chipping. In this way certain operational difficulties in barking logs, especially when these are small sized, might be avoided. Birch chips containing the bark were handled mechanically in an impact mill shown in Fig. 1. By this means, under certain conditions, it was possible to remove the outer bark, but the so-called "loose bark" was retained. Furthermore, mechanical handling tended to crush the chips. Another method for bark removal was also studied. In this case the birch chips were *soaked* in water for various time periods.

It was found that chips retaining the outer bark floated, those free from bark sank, and the separation was quite effective. Thus it was possible to remove 90 to 95 per cent of the outer bark and only 1 to 3 per cent of the wood chips actually retained bark. Fig. 2 shows the cleaned, "sunken" chips, and Fig. 3 shows chips retaining bark, and loose bark which floated on the water surface. In either case the treatment took 24 hours. This is only an orienting study and the author emphasizes the fact that many problems will have to be solved before the method can be applied in practice.

Osmo Liiri. *Paperi ja Puu* (Finland) **42**, No. 4, 293 to 298 (1960) (in Finnish, with English summary).

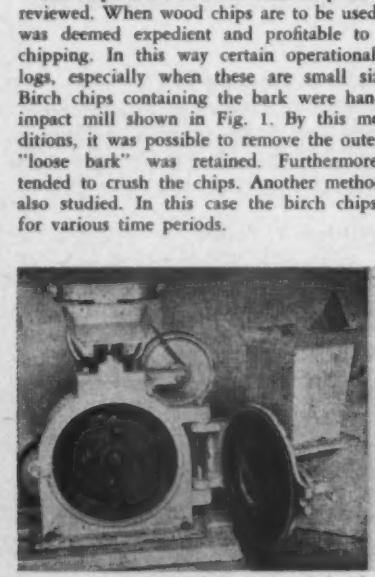

Fig. 1

Fig. 2

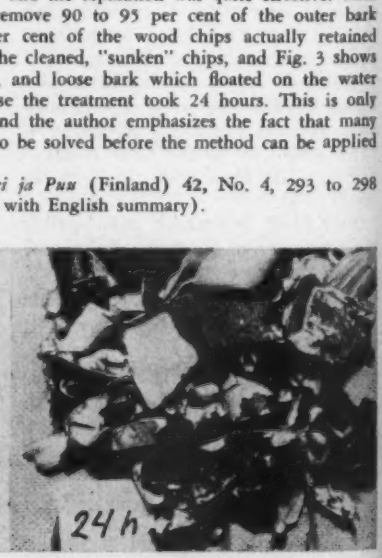

Fig. 3

Penetration was least marked through the radial and tangential directions, and was greatest along the fiber axis (the grain) due to penetration through the cross section of the wood. After the alkaline impregnations, the woods were sectioned carefully and analyzed. Full analytical data are given. Apparently samples of pulpwood having dimensions of 0.1 in. in thickness and 1 in. in length are judged to be satisfactory for the penetration of the usual alkaline pulping liquors.

24 references. E. J. Dostal, L. M. Marraccini and T. M. Kleinert. *Holzforschung* 14, 21 to 25 (1960) (in German).

Critique of the Mullen test

Two papers from different laboratories, deal with some of the difficulties encountered by using the Mullen burst tester. In the first paper (from the Institut für Lebensmitteltechnologie u. Verpackung, in Munich), the test was applied to plain and corrugated boards, and the author found marked differences when 14 different instruments were used. As a result he proposes changes for improving the test, but also points out that applying the test to boards at all is a questionable procedure, and recommends that a better test be devised.

In the second paper (which is also the second in a series, the first of which was published in *Das Papier* 11, 407 (1957), the authors point out that the rubber membranes used in Germany in the Mullen apparatus vary greatly. Their experiments were made at the Herzberg Papier Fabrik. By using standardized aluminum foils of a specific thickness, it was possible for them to determine the influence of the rubber dam used in the instrument, as well as the precision that could be expected from a specific instrument. Studies showed that by using various qualities of rubber membranes, the Mullen test could give results that varied as much as 100 per cent. Deviations were dependent on the bursting pressure. Such variations were especially marked when the burst of a paper was low; at high pressures the variations reached a certain threshold value, which was dependent on the properties of the membrane in use. To insure minimal deviations in the Mullen test, it seems essential to use only uniform membranes, fully characterized, the quality of which is known.

(1) Peter Hailer, *Das Papier*, 14, No. 7, 287 to 298 (1960) and (2) Günter Windaus and Fritz Herrmann *Ibid.* 298 to 302 (1960). (both in German, with English and French summaries).

Results obtained by the use of various pulping methods

Comparative investigations are reported regarding pulp yields and quality obtained when air-dried spruce chips were pulped by the following three procedures. (*a*) This involved a two-stage process; in the initial stage a sodium monosulfite solution (pH 9 to 10) was used and the cook was carried to 125°C. and held at this temperature for 1 hour. The liquor was then drawn off as completely as possible, and the cook was completed by digesting with a cooking liquor of acid calcium sulfite of the usual composition, but keeping the maximum temperature at 130°C. (*b*) This was a one-stage sodium bisulfite digestion at pH 4 to 4.5, using a maximum temperature of 155°C. (*c*) This was a conventional cook in one stage with acid calcium sulfite, but under extremely mild conditions, with a combined sulfur dioxide content of 1.2 g. per 100 cc. and a temperature of 118°C. These methods are referred to (below) as (*a*), (*b*), and (*c*).

The yields from (*a*) were greatly influenced by the amount of combined sulfur dioxide that was transferred from the first stage and also that supplied by the liquor of the second stage. Pulp yields decreased greatly with decreasing available combined sulfur dioxide, when comparisons were made at the same degree of delignification. Under such conditions the oven dry pulp yields from (*a*) (on the original dry wood basis) were 3 to 4.5 per cent higher than those obtained from (*b*) or (*c*). The two latter methods gave much the same yields. The importance of available combined sulfur dioxide is discussed in some detail. Judging from some recent work on the hemicelluloses and especially on the glucomannans at various pHs, it is assumed that the effects and variations found with (*a*) may be caused by the competitive action of hydrolysis and "crystallization" of the hemicellulose.

For unbleached pulps obtained at the same degree of delignification, brightness appeared to be somewhat higher for pulps made

(Continued on page 449)

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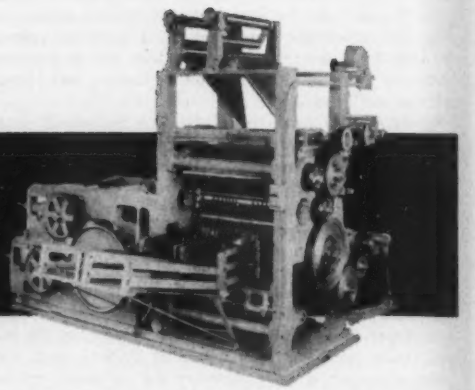

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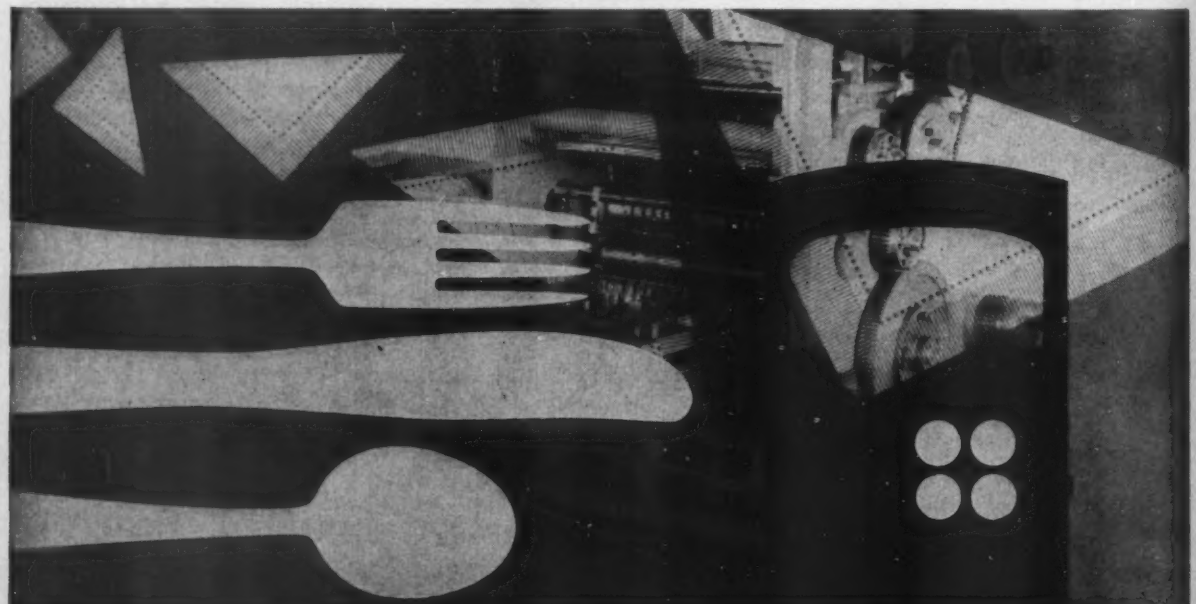

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by (*b*) than by (*a*) or (*c*); this also held in the case of chlorine consumption. Limits for yields of bleached screened pulps were about 54 per cent for (*a*) and 50 to 51 per cent for those made by (*b*) or (*c*). When digestions were made so as to obtain high pulp yields by any of the three methods, there was a great increase in chlorine consumption, with no appreciable increase in the final yield of bleached pulp. Method (*a*) gave pulps whose beating and papermaking properties were similar to those of the conventional acid sulfite pulps of the greaseproof type, but in (*a*) these properties were actually enhanced.

Extensively delignified, bleached pulps made by (*a*) were more difficult to de-water than were those made by (*b*) or (*c*) on beating to the same degree Schopper-Riegler (S-R). Pulps made by (*b*) were freer than were the other pulps, and by this method high strengths were obtained at lower S-R. Such pulps were characterized by a high tear even at a relatively high tensile strength. The greaseproof properties of pulps made by (*a*) were very satisfactory, as shown by the flame test. The scattering coefficients of the pulps decreased in the following order of preparation: (b) > (c) > (a).

Twenty references. A. Vethe, V. Loras, and F. Loschbrandt. *Norsk Skogind.* 14, 167 to 178 (1960) (in Norwegian, with English summary).

Stiffness and the printability of paper

A series of statistically designed experiments were carried out using 32 different fine papers, which were made on a miniature fourdrinier machine. An effort was made to determine the relationships between printability (as judged by solid and half-tone prints made on a laboratory proof press) and various physical properties of the paper. Paper stiffness showed no direct statistically marked correlation with printability, and the only properties related to printability were those indicative of paper smoothness. "Reproducibility" is defined as a function of the Hunter reflectometer brightness ratio of the printed to the unprinted paper surface. Actually, reproducibility was related not to printability but rather to the "tack" and the film thickness on the plate of the ink used in the test.

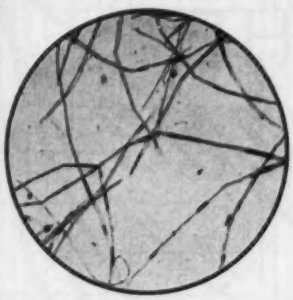
Although these two factors (together with printing speed) do affect the coefficient of ink transfer, print opacity was not related to printing speed. Significant correlations were obtained for seven combinations of the following five physical properties: Clark, Olsen, and Gurley stiffness, compressibility, and Young's modulus. Gurley stiffness was related closely to Clark stiffness, and Olsen stiffness showed a relationship to compressibility.

B. Suzuki. *J. Japan. Tech. Assoc. Pulp Paper Ind.* 14, No. 2, 99 to 109 (1960) (original in Japanese, with English summary) through *Abstr. Bull. Inst. Paper Chem.* 30, 1192 (1960).

Possible chemicals from spent pulping liquors

Periodic or continuous heating of concentrated spent sulfite or sulfate black liquors with limited amounts of sodium sulfide and caustic soda yielded up to 50 per cent of ether soluble compounds (based on the weight of the organic matter in the liquor.) These ether solubles included degradation products of the lignin and of the carbohydrates. The phenolic fraction, which amounted to about 200 kg. per ton of pulp, has novola-like properties and can be hardened with substances like hexamethylenetetramine. Somewhat similar yields of ether soluble compounds can be obtained by the continuous heating of spent liquors with sodium hydroxide at atmospheric pressure, but in such cases the amounts of alkali required exceed 50 per cent of the organic matter present. Among the reaction products isolated were pyrocatechol (about 3 per cent) and such derivatives as 4-acetopyrocatechol, protocatechuic aldehyde and protocatechuic acid. A sample of commercial black liquor was shown to contain vanillin and acetoguaiacone, each of which amounted to about 2 kg. per ton of cellulose produced.

Terje Enkvist. *Svensk Kem. Tidskr.* 72, 93 to 106 (1960) through *Abs. B.I.P.C.* 30, 1326 (original in Swedish with English summary).



Celgar Kraft will contain long, thick-walled fibres

1. High Tearing Resistance

Celgar Kraft will contain long, strong fibres such as these from Interior-grown western hemlock. They will give the final paper product the high tearing resistance which is the outstanding characteristic of Western Canadian kraft pulps.

Celgar Kraft

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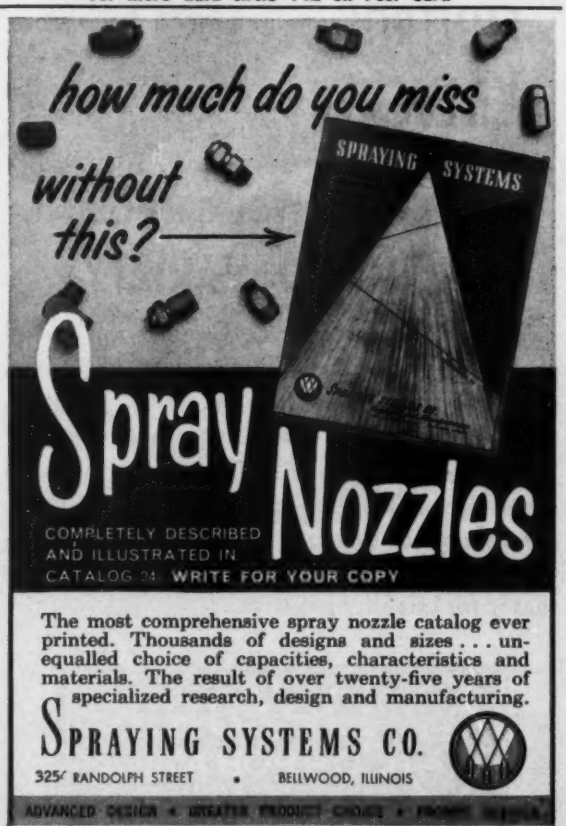
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PATENT REVIEWS

DR. MELVIN NORD

Machine for and method of corrugating paper

U. S. 2,938,568, issued May 31, 1960 to William H. Cock and assigned to Arkell Safety Bag Co., describes a machine for and a method of corrugating paper.

The corrugating machine, as shown in Figs. 1 and 2, utilizes the first drum 4 of the drum dryer, which may be steam-heated at a temperature of 190° F. The canvas blanket 5 is omitted from this drum, the blanket starting with the second drum. A roller 6 is mounted above the first drum 4 and parallel with it. This roller is substantially the same length as the drum and is provided with grooves 8 spaced apart one-half inch from their centers. Endless belts 10 pass in the grooves 8 and over the drum.

A second set of endless belts 12 engage between the belts 10. This set passes over grooved rollers 14 at opposite sides of the upper portion of the drum, guide rollers 16, and a grooved roller 18 positioned between the guide rollers.

The paper web may be conveyed from the crinkling machine by means of an endless conveyor 20. As the web leaves the conveyor, it passes downwardly between the forward converging portion 21 of the two sets of belts 10 and 12. As the web is carried about the drum by the belts, the outer belts 12 force it over and between the inner belts 10. The converging portions 21 of the belts gradually and uniformly work the web between the two sets

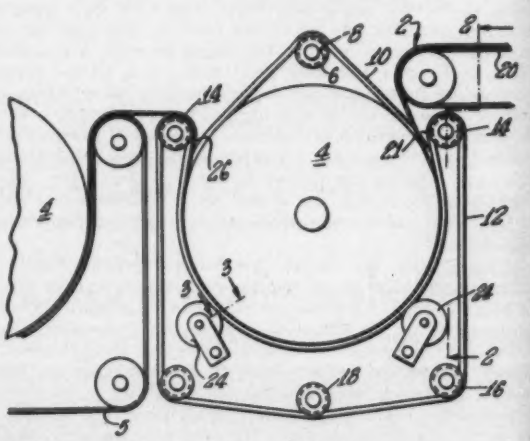

Fig. 1

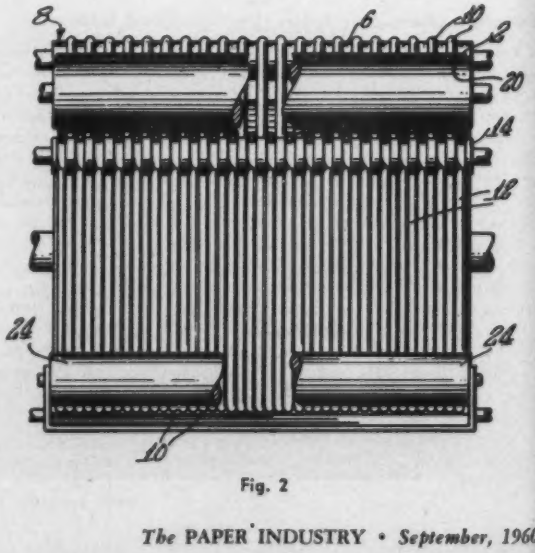

Fig. 2

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of belts, and between the belts of the inner set. This results in uniform rounded corrugations being formed in the web which become set as the web passes from the drum and over the rear grooved roller 14.

As the web approaches the diverging portions 26 of the belts, it is gradually and uniformly separated from the inner belts and drum.

After passing from the rear grooved roller 14, the web is carried by the blanket 5 over the next drum 4, and successively over the other drums of the dryer to complete the drying of the web, usually to a normal moisture content of about six per cent.

Drainage element for paper machines

U. S. 2,928,465, issued March 15, 1960 to Peter E. Wrist and assigned to The Ontario Paper Co. Ltd., provides a stationary drainage element in substitution for the revolving table rolls, whereby kick-up is substantially eliminated without objectionable impairment of the drainage capacity. The drainage element is adjustable in order to allow the drainage capacity to be varied to suit the varying stock and machine conditions.

U. S. 2,928,466, issued the same date to George Burkhard and Peter E. Wrist and assigned to the same assignee, provides alternative means for improving drainage on paper machines.

High-fold endurance paper

U. S. 2,932,603, issued April 12, 1960 to George B. Sterling and assigned to The Dow Chemical Co., describes a method of making a high-fold endurance paper.

The sheet is formed from an aqueous suspension of a mixture of paper-making fibers and a synthetic latex of a copolymer. The copolymer contains 40 to 60 per cent by weight of butadiene, 15 to 40 per cent of acrylonitrile, and 20 to 35 per cent of methyl isopropenyl ketone.

Impregnation of fiberboard

U. S. 2,931,737, issued April 5, 1960 to Jesse Thornton and assigned to Hickson's Timber Impregnation Co. (G.B.) Ltd., describes a process for the controlled impregnation with an impregnant liquid of a highly absorbent fiberboard of compressed comminuted cellulose having a density not exceeding 720 kg/m.^{3}

The fiberboard is subjected in a pressure vessel to an initial super-atmospheric gas pressure not greater than 3 kg./cm.^{2} for 5 to 20 minutes. An impregnant liquid is then introduced into the pressure vessel under a pressure greater than that of the initial gas pressure but not greater than 7 kg./cm.^{2} for 10 to 60 minutes to force the impregnant liquid into the fiberboard against the initial gas pressure.

There is thus obtained a relatively high concentration of impregnant in the outer portions of the fiberboard while leaving the center portion substantially free of impregnant, following which the liquid pressure is released.

Sulfate liquor recovery process

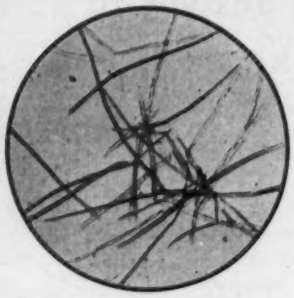
U. S. 2,928,184, issued March 15, 1960 to Harold E. Lonngren and assigned to Esso Research & Engineering Co., describes a process of drying black liquor obtained as spent cooking liquor from the sulfate process for the production of pulp, in which fluidized granulated black ash is used as carrier of the heat which is needed for the drying step proper.

The first step in the process consists of heating previously dried black ash with heat which is derived solely from the combustibles of the black ash itself. The second step consists of utilizing the heat thus obtained to drive off the moisture content of the black liquor feed in a drying zone, to secure a dry residue which lends itself to combustion in the smelter.

Production of pulp from bagasse

U. S. 2,932,600, issued April 12, 1960 to Edward L. Powell and assigned to Brown and Root, Inc., describes a process for producing purified cellulose pulp from bagasse.

The bagasse is agitated with steam under a pressure of 100 to 125 pounds per square inch for a period of 30 minutes to 1 hour. The pressure is then relieved rapidly to one-half or less than half of its highest value. Two to three per cent caustic solution is then added, in the proportion of 5 parts of solution to 1 part bagasse by weight.



Celgar Kraft also will contain thinner-walled fibres

2. High Bursting Resistance

Celgar Kraft also will contain thinner-walled fibres from such species as spruce, balsam and cedar. These impart to the final paper product the high bursting resistance which is the outstanding characteristic of Eastern Canadian and Scandinavian bleached kraft softwood pulps.

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Patent Reviews . . .

The mixture is then agitated and cooked with live steam under a pressure of 100 to 125 pounds per square inch for 30 minutes to 1 hour.

Manufacture of fillers and pigments for paper

U. S. 2,935,438, issued May 3, 1960 to William L. Craig and assigned to R. T. Vanderbilt Co., Inc., describes a method of making a material which can be used as a filler or pigment in the manufacture of paper which will impart improved physical and optical properties to the product and still be economical.

Fig. 3 shows an example of the manner in which the process is carried out. The following weights and volumes of chemicals are used:

Material	Weight, pounds	Volume, gallons
Fiber (Virgin chemical or broke) 1,000 lb. at 3 per cent Consistency	33,333	3,990
Calcium Chloride (78.5 per cent Commercial)	1,615	112
Sodium Silicate (37.5 per cent)	9,660	833
Dilution Water for Silicate (37.5 per cent to 10 per cent)	26,657	3,190
Alum (2,500 lb. at 5 lb. per gal.)	6,620	500
Total	77,885	8,625

The 833 gallons of concentrated sodium silicate are transferred from the concentrated silicate storage tank 10 to the silicate dilution tank 11 through the meter 12 and the valve 15 at the rate of 40 gallons per minute. 3190 gallons of dilution water are then added to the tank 12 through the pipe 16 and meter 17 at the rate of 100 gallons per minute. The silicate is diluted and mixed by the agitator 21. After the solution has been mixed for 5 minutes, it is ready for use.

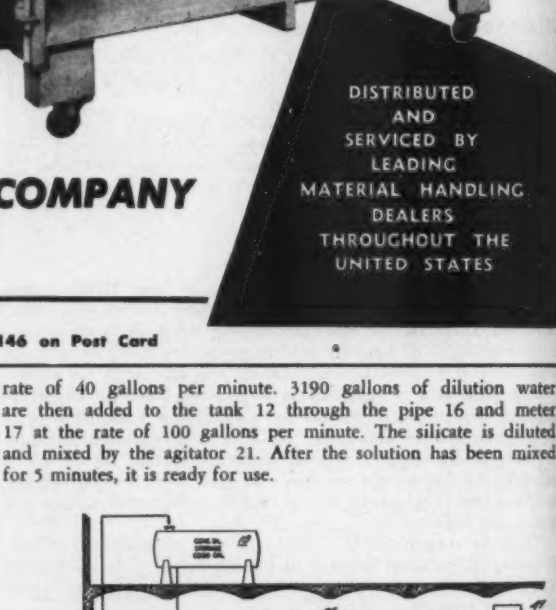


Fig. 3

The 3 per cent stock solution from the beater is added to the reaction tank 22 through the pipe 25 and is agitated by a vertical paddle agitator 26. Sixteen bags containing 1650 pounds of 78.5 per cent commercial calcium chloride are then added to the reaction tank 22 as indicated at 27, while continuously stirring the mixture with the agitator 26. The mixture is circulated through the pipe 30, the pump 31, the pipe 32 and the return line 35, while agitating for 35 minutes. During the reaction between the calcium chloride and the fibers, the temperature is maintained at 25° C. At this point the reaction between the calcium chloride and the sodium silicate may be carried out. Accordingly, the diluted sodium silicate is pumped through the pump 36 to an auxiliary inlet port near the impeller of the pump 31 in the zone of high shear. The pump 31 has a capacity capable of delivering at least 400 gpm. of 3 per cent stock slurry. Since it is preferred to ob-

tain as much reaction as possible between the sodium silicate and the calcium chloride in the zone of high shear in the pump 31, and this condition may be brought about most readily using high ratios of normal flow through the pump (i.e., through the pipes 30 and 32) to the auxiliary flow added through the pipe 36' it is preferred to maintain the volume ratio of flows through the pump 31 at least about 6.5:1. After an interval, usually about 5 minutes, has been allowed for the reaction of the sodium silicate and calcium chloride, the 500 gallons of aluminum sulphate solution are added to the pump 31 through the pipe 40 while continuously recirculating the calcium silicate pulp slurry through the pipes 30, 32 and 35 and the pump 31. The point at which the pipe 40 is tied in with the inlet of the pump 31 is also as close as possible to the pump impeller so that the reaction between the aluminum sulphate and the calcium silicate will take place in the zone of high shear adjacent the impeller of the pump. The aluminum sulphate solution is added through the pipe 40 at the rate of about 17 gpm. while circulating the calcium silicate-pulp slurry at the rate of about 400 gpm. so that the time of reaction between the aluminum sulphate and calcium silicate is about 30 minutes. The product is then pumped through the pipe 41 to the agitated storage tank 42. From there it is pumped through the weirbox supply pump 45, and the pipe 46 to weirbox 47. From the weirbox 47 the fibrous filler or other calcium silicate-alum pigment slurry is distributed to the paper machine through the pipe 50 as desired.

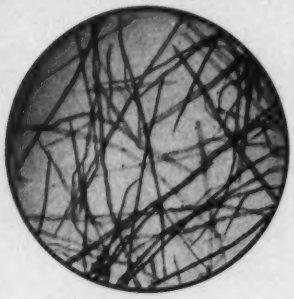
Method of resisting digester corrosion

U. S. 2,938, 825, issued May 31, 1960 to Frederick H. Richter and assigned to The Babcock & Wilcox Co., describes a method of resisting digester corrosion.

After cooking at a temperature of at least 275° F. under pressure, the digester is blown to remove the charge, and the digester vessel is cooled to a temperature below the boiling temperature of the cooking liquor by contacting it with a noncorrosive cooling liquid.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Carton package	King Sales & Engineering Co.	2,931,490	4/5/60
Carrying device for containers	American Can Co.	2,931,491	"
Can pack, carrier tube and blank	Cornell Paperboard Products Co.	2,931,492	"
Conditioning papermaking stock	Clark & Vicario Corp.	2,931,503	"
Prehydrolyzed sulfate chemical wood pulp	The Buckeye Cellulose Corp.	2,931,734	"
Molded overlay panel of low moisture absorption	The Whirlpool Corp.	2,931,750	"
Apparatus for separating used liquor from pulp	Aktiebolaget Kamyr	2,932,396	4/12/60
Carton holder	Doyle M. Baumgartner	2,932,423	"
Bottle carrier	Federal Paper Board Co., Inc.	2,932,424	"
Bottle carrier	Container Corp. of America	2,932,425	"
Paperboard shipping containers for water heaters	Crown Zellerbach Corp.	2,932,438	"
Rigid cardboard gift boxes	Earl L. Sparling	2,932,439	"
Paper coating composition	The Glidden Co.	2,932,589	"
Carton sealing machine	International Paper Co.	2,932,927	4/19/60
Pulp manufacture	Sprout, Waldron & Co., Inc.	2,933,208	"
Molded egg carton	Continental Can Co., Inc.	2,933,227	"
Container	Waldorf Paper Products Co.	2,933,228	"
Milk, oil and fruit container	Duryea Bensel et al	2,933,229	"
Carton	General Foods Corp.	2,933,230	"
Cellular carton	KVP Sutherland Paper Co.	2,933,231	"
Carton	Aldo Bugnone	2,933,232	"
Moisture removal system	Paper Converting Machine Co., Inc.	2,933,825	4/26/60
Papermakers' dryer felts	Thomas Hindle et al	2,934,097	"
Adjustable stock inlet for papermaking machines	Beloit Iron Works	2,934,140	"
Suction flat box cover perforation	Beloit Iron Works	2,934,143	"
Composite molded paper pulp egg tray	Louis Schwartzberg	2,934,233	"
Poultry freezer tray	River Raisin Paper Co.	2,934,250	"
Folding box	William J. Boas & Co.	2,934,254	"
Bag closure	International Paper Co.	2,934,255	"
Combination jordan and disc refiner	The Noble & Wood Machine Co.	2,934,278	"
Dry gloss pre-cast clay laminated paper	Bergstein Packaging Trust	2,934,467	"



Celgar Kraft will have balanced properties

3. Balanced Properties

Through its mixture of long, strong, thick-walled fibres and its thinner-walled fibres, and due to the climatic conditions influencing tree growth, Celgar Kraft will achieve naturally a balance of strength properties which can normally only be duplicated by blending several grades of pulp.

Celgar Kraft

V5763-3

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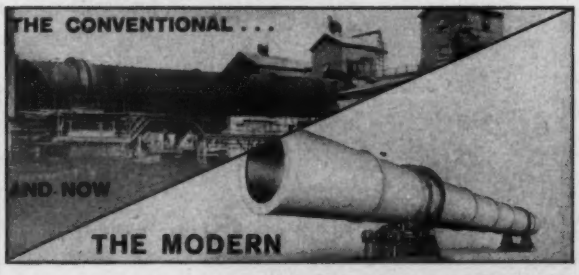

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The Vulcan Iron Works, Inc., in Wilkes-Barre has the "know-how" when it comes to designing and building rotary kilns for any application.

From kilns built years ago which were held together by rivets, TO the modern patented Vulcan kiln of today, electronically welded and designed for years of trouble free service. . .

If you are in the market for a kiln, why not let Vulcan give you some suggestions and preliminary drawings for your consideration.

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VULCAN IRON WORKS, INC.,

WILKES-BARRE, PA. • CABLE ADDRESS: VULWORKS

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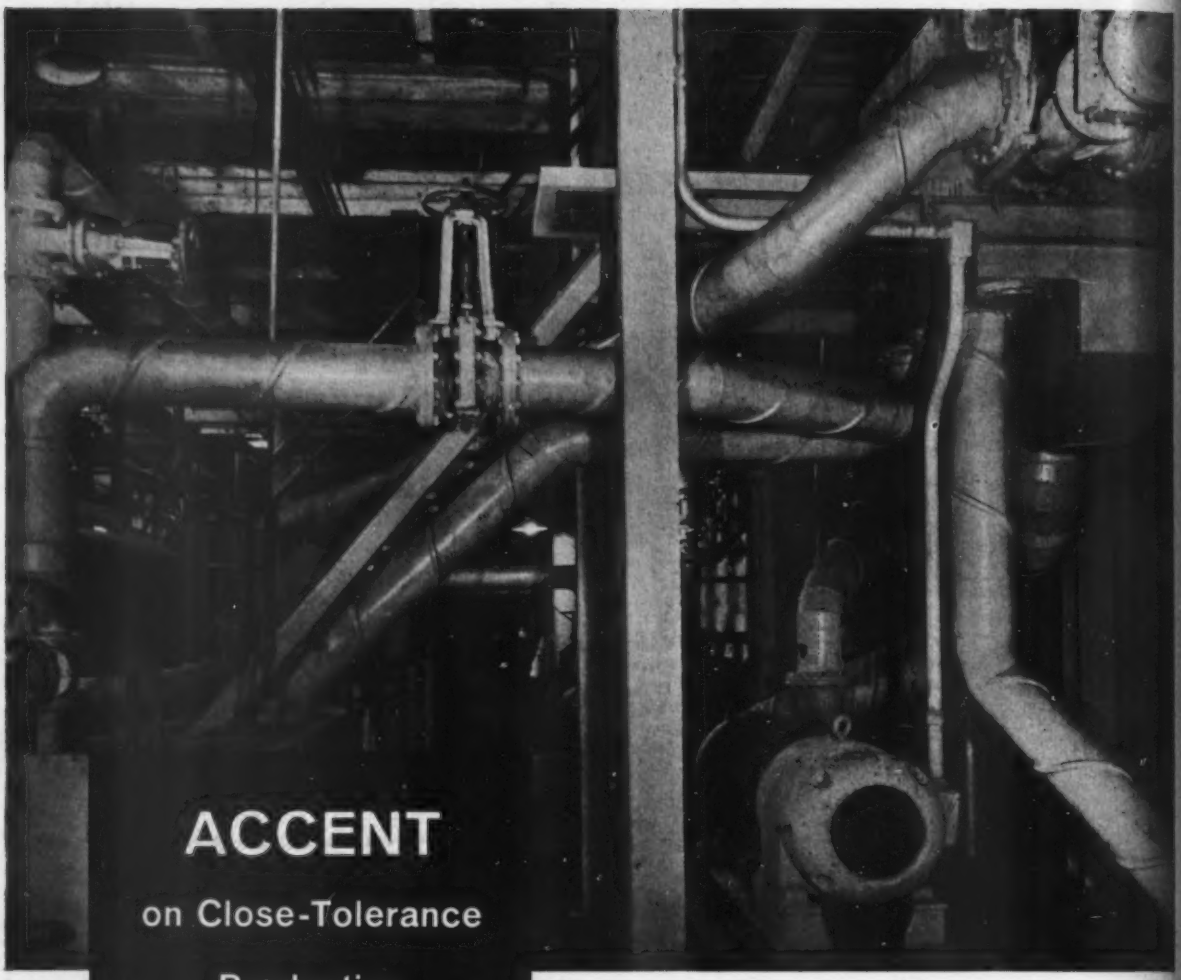
For more data circle 148 on Post Card



NAYLOR FABRICATIONS

in Carbon Steel, Alloys or Stainless Steel

NAYLOR Fabrication Service is geared for accurate production of paper mill pipe, fittings and special fabrications to your most exacting specifications . . . from carbon steel, alloys or stainless steel.

Pipe sizes range from 4″ to 30″ in diameter and wall thickness from 14 to 8 gauge. Special piping fabrications from 3″ to 44″ in diameter and wall thickness up to ⅜″. Standard fittings are available from stock.

Write for Bulletin No. 59 or send specifications for quotation.

NAYLOR PIPE *Company*

1233 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

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FOR FURTHER INFORMATION ON

- New Products
- New Literature
- Advertised products and services

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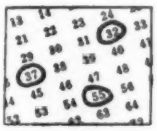

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SEPTEMBER, 1960

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New Products and New Literature

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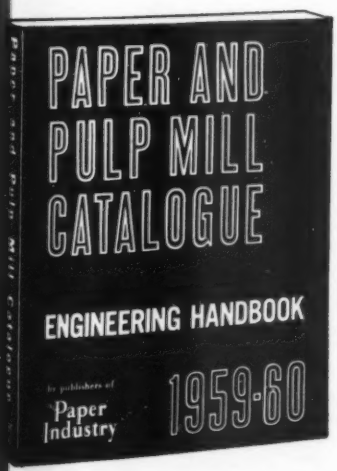

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Every operating paper and pulp mill in the United States and Canada

A one-volume, composite Catalogue or permanent classified Reference File of manufacturers' catalogues, a Buyers Service Section, and the Engineering Handbook. Published annually in September.

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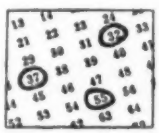

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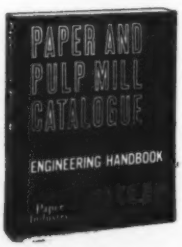
- **Manufacturers Catalogue Section** — contains pages and complete inserts giving information and data on products of individual manufacturers. Pages appear in alphabetical order by names of manufacturers.
- **Buyers Service Section** — includes a comprehensive, cross-reference list of machinery, equipment, materials and chemicals with names of responsible manufacturers and suppliers; a list of trade names; complete addresses of all firms that are listed in the Section; and a directory of educational institutions in the United States and Canada having courses of instruction in the manufacture of pulp and paper.
- **Engineering Handbook Section** — a compilation of practical engineering data, formulas, graphs, charts, tables, etc., including a section dealing with uses and hazards of chemicals used in pulp and paper making. New material added yearly.



Paper and Pulp Mill Catalogue
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NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Hydraulic hand jacks

A new series of heavy-duty hydraulic hand jacks, designed for both automotive service and general industrial use, is available in 30-, 50-, and 100-ton models. These jacks operate in vertical or horizontal position. They are especially adapted to filter-press, shop-conversion and production-line applications, and are ideal for bending operations, lifting heavy loads, moving machinery and pressing bushings.

There are convenient positioning handles on all models. WA-300, the 30-ton jack, has a rigid positioning handle, while WA-500 and WA-1000 each have two fold-down positioning handles. Two piece pumping handles are also provided. *Weaver Mfg. Co.*

Circle No. 1 on Readers' Service Card

Moisture control detector

The model 300-F moisture detector is said to promise accurate moisture control with an adjustable sensitivity for any weight of paper (from .0003 to the heaviest board). The detector is designed for use with any Stickle Pres-Ten-Trol system to control moisture content automatically during paper drying.

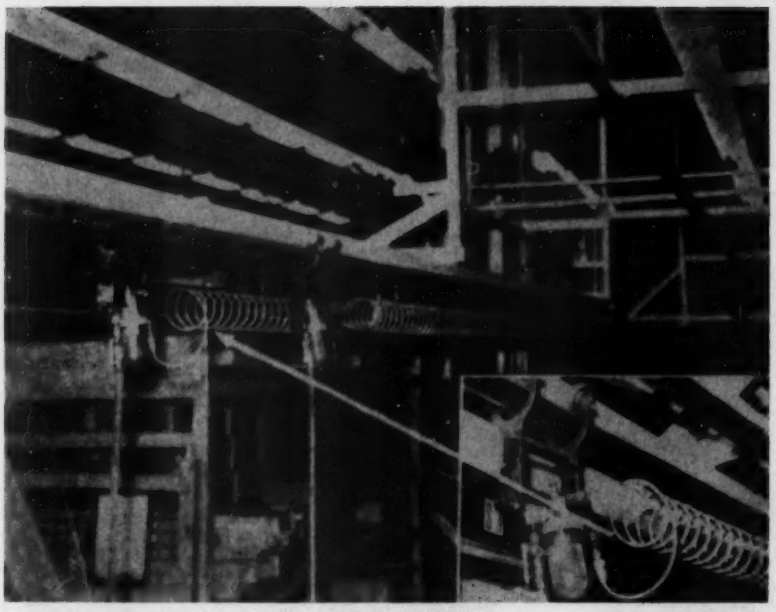
A numbered dial on the detector permits quick setting of any desired sensitivity, while a proportional band prevents over-regulation. On machines running a wide range of basis weights, the best setting for each weight is quickly obtained. An identical setting may be accurately duplicated whenever the same weight is run again. *Stickle Steam Specialties Co.*

Circle No. 2 on Readers' Service Card

Water storage tank

A low cost, ground-level, high-capacity reservoir, called the Cylindroid, is designed to meet a critical need among growing communities for a low-cost reservoir which can be built to any capacity in order to serve present and future requirements. The tanks are said to provide approximately 16 per cent more storage capacity than do comparable cylindrical tanks. Less costly to build because it makes possible the use of lighter steel, the tank requires a minimum of shop forming and prefabrication. The manufacturer states that the tank can be erected on the site with a small crew and light equipment. *Graver Tank & Mfg. Co.*

Circle No. 3 on Readers' Service Card



Retractable air hose

The new S12 synflex self-storing air hose with a ⅜-in. dia., extends and retracts like a telephone extension cord. With a total hose length of 25 ft., it has an extended working length of 20 ft. and retracts into a compact storage space-saving coil of only 5 in. dia., 9 in. long. Originally designed to replace the old-fashioned type rubber hose, the new and larger S12 utilizes the same principle for compressed air lines of larger and heavier types of blow guns, pencil grinders, chippers, disc sanders, air hoists, etc.

Made from a special nylon formulation, the hose is said to be impervious to oils and to have great dimensional stability and toughness. *Synflex Products Div., Samuel Moore & Co.*

Circle No. 5 on Readers' Service Card

Precision mirror finishes

Precision mirror finishes to less than one micro-in. are reportedly being produced on chromium plated rolls weighing as much as 10,000 lb. and as large as 46 in. in dia. Profilometer readings of .5 micro in. can be attained due to new production equipment and improved grinding and polishing techniques now in use.

The new super finishes will mean more uniform transparency and smoother surfaces than those now obtainable on film and sheet products produced by the plastics and paper coated paper industries, where large rolls are used in casting and finishing. *U. S. Metal Coating Co.*

Circle No. 4 on Readers' Service Card

Floor resurfacer

A trowel applied, epoxy-type material called Chemi-top, reportedly can be applied over old concrete, wood or metal surfaces at a thickness of only ⅛ in. The minimal thickness of the coating eliminates the need for moving heavy equipment, or the alteration of doors, sills, and drains. The topping is highly resistant to acids, alkalis, detergents, solvents and chemicals.

The manufacturer reports extremely good results on tests for bond strength flexibility, compressive and tensile strength. Chemi-top is said to be 4 times stronger in these properties than concrete and less than one-half the cost of quarry tile. *Garland Co.*

Circle No. 6 on Readers' Service Card

Solid film lubricants

Specific solid film lubricants have been developed and perfected which operate

without deterioration when exposed to nuclear irradiation of the order of 1×10^7 Roentgens up to 1×10^9 Roentgens at temperatures up to 550° F. Not only are these solid film lubricants said to be unaffected by exposure, but wear life properties after exposure are reported to be actually increased by over 30 per cent. When the exposure was 3×10^{14} NVT up to 3×10^{16} NVT, the wear life was unaffected.

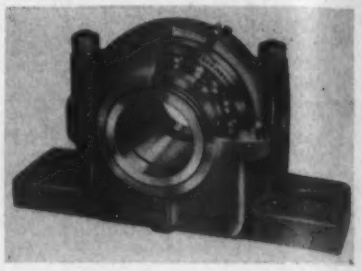
These Electrofilm dry film lubricants are also reportedly corrosion resistant, and lubricate efficiently in temperatures from −65° F. to +1800° F. Their friction and wear life properties are such that they can meet Mil Spec 25504. *Electrofilm Inc.*

Die cutter and embosser

A combination die cutting and embossing press is now available which features 550 tons pressure and handles sheet sizes to 36¼ by 49½ in. The upper platen, equipped with a built-in heater, does not have to be removed from the press when die cutting. A maximum heat of 320° F. reportedly can be obtained and held, and special provision has been made to allow for heat expansion in order to protect the vital parts of the press.

This newly designed machine is equipped with a special clutch mechanism which can be activated by turning an electric switch. Under normal procedure, the press is said to run up to 4500 sheets/hr. for die cutting and stripping. *Thomson-National Press Co. Inc.*

Circle No. 7 on Readers' Service Card



Pillow blocks

Cutaway view shows new heavy-duty pillow block with self-aligning spherical roller bearings in split housing. All 143 sizes are available with straight bore bearings for shouldered shaft mounting, or with adapter bearings suitable for mounting on straight commercial shafting.

An integral guide flange, adding strength to the bearing inner ring, guides the rollers and prevents roller skew. Housing design accommodates either grease or oil bath lubrication and triple labyrinth seals are said to retain either oil or grease and prevent entrance of dirt. The close running clearance of these seals, without rubbing contact, allows them to operate under conditions of normal misalignment. *Torrington Co.*

Circle No. 8 on Readers' Service Card

Speed reducers

A completely new line of fan-cooled worm gear speed reducers is now available in 25 types and over 135 different sizes. Ratios range from 5:1 to 3600:1, with torque ratings up to 135,000 lb. in. and hp. ratings up to 150.

These speed reducers are right-angle drives which adapt compact, high speed motors to modern production machines. They are said to be capable of operating at high input speeds and cover the range from fractional to large hp. motors as demanded by industry. They offer low output speeds with ample capacity for heavy loads, assuring smooth, quiet transmission of power with minimum maintenance. *Link-Belt Co.*

Circle No. 9 on Readers' Service Card

Injection oiler

Designed specifically for use with low-volume, short-stroke air cylinders, the new Watts No. 608 injection oiler provides proper lubrication previously impossible with ordinary mist-type lubricators, reports the manufacturer.

Installed in the pressure line between control valve and cylinder, the injection oiler delivers a controlled amount of oil direct to the cylinder through a capillary tube within the cylinder air supply line. Oil is supplied to the injection oiler, either

Like Riding On A Cloud
NEW
Detail of air vent
The new type AIRFLOAT Table as applied to a self-powered, traveling Skid Stacker, available with fixed or elevating top.

LAMB

AIRFLOAT® TABLE

Low Initial Cost and Operating Economy

A *new* development in the well-known LAMB Airfloat Table—an economical, open-orifice design providing constant, all-over escape of air from the table top. No marking of bottom sheets—no expensive air-release valves. The unusually small, open holes provided permit use of very low air pressure, furnished by a blower. The constant escape of air is very light and creates no bothersome effect in this new, cost-saving LAMB Airfloat Table. Stacks push effortlessly on a film of air.

Yes—the standard LAMB Airfloat Table with ball air-escape valves is also available. Write for literature.

Write for complete information.

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HERE'S AN EXAMPLE OF IN STOCK M-G SETS

QY	KW	MAKE	SPEED	DC	AC
*1	750	WHSE.	900	250	2300
*1	600	WHSE.	900	250	4160
1	500	G.E.	600	600	2300
1	360	G.E.	1200	250	440
1	300	WHSE.	1200	250	2200
4	250	G.E.	1200	250	440
1	150	G.E.	1800	250	440
12	60	G.E.	1200	250	440
8	50	G.E.	1200	250	440

ALSO MANY OTHERS.

*WITH SPARE ARMATURE.

For more data circle 151 on Post Card

New Products . . .

from a standard lubricator placed ahead of the control valve, or from a small oil reservoir under pressure. It is also available in kit form with necessary fittings and tubing. *Watts Regulator Co., Industrial Div.*

Circle No. 10 on Readers' Service Card

Material level control

A self-contained instrument that mounts on a 1¼-in. pipe coupling has been developed to determine the presence or absence of material at a desired level in a bin, hopper, storage tank or similar container. This device can be used for material level surveillance and control or for quantity measurement in processing and storage containers.

A rotating paddle in the container controls the generation of a small signal. A transistor circuit increases this signal and operates electrical contacts to control equipment or operate indicators to correct unsafe conditions. The unit may be obtained for high-level or low-level, fail-safe operation. *Flo-Tronics Inc.*

Circle No. 11 on Readers' Service Card

Self drilling anchors

A complete line of 14 self drilling anchors that includes types for hand installation as well as impact hammer, is marketed under the trade name "Hi".

According to the manufacturer, the "Hi" anchor is a combination drill and fastener that incorporates new features to produce fast drilling and maximum holding power. Each anchor has 8 cutting teeth of special design and shape to assure fast, clean cutting action. Diamond or carbide drills are not required. Both the shell and expender plug are made of case hardened steel, zinc plated to prevent rusting. *Holub Industries Inc.*

Circle No. 12 on Readers' Service Card

Mr. Du
SAYS:
Felts I find are not a problem
Just get in touch with Mr. Du.
Then check my record anytime
You'll be pleased how I work for you.
DuBois Chemicals
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Including research and field-proved, dependable T-743-Fit. Has made significant improvements in felt life, machine operation, economy. No brush felts, residues, absorbency loss on melamines, colors, pitch. Comes ready to dilute with water. Write today for test samples: Paper Mill Dept., DuBois Chemicals, Inc.
40 years of cleaning experience at your service
DuBOIS CHEMICALS, INC.
Broadway at 7th • Cincinnati 2, O.

For more data circle 152 on Post Card

Modular type press

This flexographic press is available in sizes from 15 to 42 in. and may be used as a tail end printer or in full roll to roll operation. The equipment features pre-drilled frame construction for stacking of up to six colors and running register control with positive lockup via helical gearing. *Faustel Inc.*

Circle No. 13 on Readers' Service Card

Rider truck

The development of a quickly removable, rider-type, remote control platform that can be used to operate a standard narrow aisle, high stacking model "MN" aisle-master, has been said to add a new dimension to order picking equipment.

A full set of controls for steering, lifting, lowering and driving in forward and reverse are located on the rider type, remote control platform. This development is said to provide a versatile combination, which allows the operator to use a standard "MN" narrow aisle truck for regular right angle stacking operations. *Lewis-Shepard Products Inc.*

Circle No. 14 on Readers' Service Card

400 point recorder

The K-logger, a new type of multiple recorder and annunciator, is said to record and display, on one chart, all the variables

"Man O'man... relaxation during leisure hours takes on a new meaning since we began using more WISCONSIN WIRES at the mill"
WISCONSIN WIRE WORKS
APPLETON · WISCONSIN

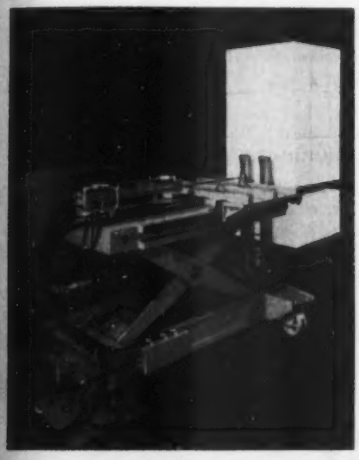
ks

New Products . . .

in even the most complex of processes, and is a miniature graphic panel in its own right.

Concentrating the accumulation and display of large amounts of process data into one unit is said to allow control rooms and instrument panels to be greatly reduced in size. Control panels, which now range in length up to 100 ft. or more, can be reduced to the point that a single supervisor can watch from one spot, the aspects of a process operation. *Keinath Instrument Co.*

Circle No. 15 on Readers' Service Card



Pulp bale stacker

A fork lift pulp bale stacker, fully automatic and hydraulically actuated, is said to be capable of holding, stacking and discharging both uniform and varying sized pulp bales. It stacks any pre-set number of bales within its capacity and discharges the stacks to a conveyor or fork truck pick up. The manufacturer also states that the new machine will also stack untied bales, and then swing to deposit them on pallets for wrapping and strapping into "jumbo" packages. *Lamb-Grays Harbor Co. Inc.*

Circle No. 16 on Readers' Service Card

Rust remover

Cor-O-dex is the new chemical solution that is said to remove rust and corrosion from iron, steel, stainless steel, brass, bronze, copper, nickle and aluminum. This product may be applied to any metal surface by brush, spray gun, cloth or immersion. *Allied Products Co.*

Circle No. 17 on Readers' Service Card

Non-lube compressors

Using four of these new type non-lube compressors, a prominent company recently began the manufacture of a new tri-acetate fiber called Arnel 60 which will reportedly make possible finer count yarns and lighter weight cloth. The newly developed fiber cannot be produced on present equipment because it requires the use of oil-free air.

The new compressors, utilizing teflon piston rings and trim, will produce the needed process air in the manufacturing cycle. The units are of balanced/opposed design and are driven by electric motors. A single control panel automatically regulates and operates all four machines. *Clark Bros. Co.*

Circle No. 18 on Readers' Service Card

Adhesive

Rubbastix, a new, non-inflammable, water-based adhesive for bonding polyethylene, polystyrene, vinyl, wood, foamed plastics, paper, fabric and other materials, has recently been developed. This adhesive can be applied by brush, roller coater or spray and dries permanently. It will dry in one-half hour at room temperature but drying time can be speeded to 4 min. with hot air or infra-red heat. *Rubba Inc.*

Circle No. 19 on Readers' Service Card

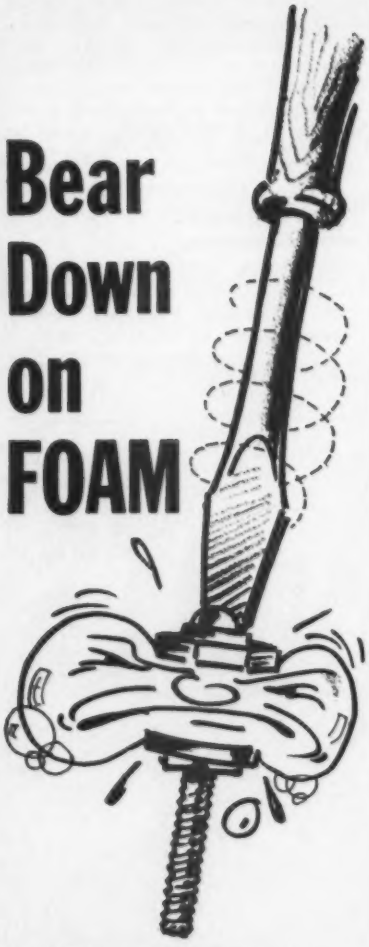
Crane end trucks and accessories

A new line of crane end trucks and accessories is now available for users who wish to assemble their own overhead traveling cranes. All necessary components except the structural steel bridge girder and the drive shaft are supplied.

NO WRINKLES
NO Hard or Soft Spots at the Winder with . . .
RMF hydroscillators
This simple, compact oscillating unit provides a constant horizontal shifting motion while the sheet is being wound into a roll. This back and forth movement prevents wrinkles from "tracking" and building up throughout the roll. No more wrinkles, no more hard and soft spots!
Check your finishing room...our RMF Hydroscillators will give you a higher percentage of salable paper. For more information send for Bulletin No. 101.
M-R
ROSS MIDWEST FULTON
A Division of Midland-Ross Corporation
Box 846, Dayton, Ohio

For more data circle 154 on Post Card

Bear Down on FOAM



with Dow Corning Silicone Defoamers*

There's a *right* tool for every job. In foam control it's Dow Corning silicone antifoamers or defoamers . . . job-proved thousands of times over as the most efficient, most economical, and most versatile foam suppressors available.

*At prescribed levels, are sanctioned by FDA

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and new manual on foam control

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Please rush a FREE SAMPLE of a Dow Corning silicone defoamer for my product or process, which is (indicate if food, aqueous, oil or other): _____

NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

_____

For more data circle 155 on Post Card

New Products . . .

The new line, offering 18 ratings for spans to 50 ft., has load capacities ranging from 1 to 10 tons. Both light and heavy duty models are available.

A line of torque arm center drive assemblies is available for heavy-duty motor driven designs. Other available accessories include magnetic controls, current collectors, and cross shaft bearings and couplings. *Robbins & Myers Inc.*

Circle No. 20 on Readers' Service Card

Conical refiner

This refiner, called the Claflin 202, has been designed for those mills having need for a refiner of smaller capacity, between 15 and 75 tons per 24 hrs. It is claimed to withstand operating pressure of 100 psi.

Other features are: oil mist lubrication; split design in the large reinforced head to assist in changing fillings; center or tangent discharge pipes cast as part of the shell housing; tangent cleanout and sand trap.

The model 202 also comes equipped with one-setting Fast's Full Travel coupling which requires no change of setting during the life of a filling. All types of tackle can be used and changed without disturbing the bearings or packing box assemblies. *Emerson Mfg. Co.*

Circle No. 21 on Readers' Service Card

Infinite range speed control

A new air control, now available, is said to provide remote or automatic speed control over an infinite range. Air signals, varying from 3 to 15 psi, produce linear speed variation from any desired maximum speed to zero. Speed may be set by manual air valve or automatically by a signal generated by a variety of pneumatic transducers. Response is fast and accurate.

The transmission is available with several styles of built in reducers and with a variety of motors, including explosion proof. It can be furnished with micrometer, remote micrometer, and electrical controls in addition to the pneumatic control. *Graham Transmissions Inc.*

Circle No. 22 on Readers' Service Card

Illuminated magnifying viewer

An illuminated 3-D magnifying viewer for close tasks or viewing that requires bright lighting and full view magnification has just been developed. The new viewer, known as model DSV, features a 6- by 6-in. optically ground acrylic lens that provides full 3-dimensional perception. Two 4-watt fluorescent tubes highlight the working

INSTALL *OVERLY* VEE-GRIPS IN YOUR STOCK LINES

- **A tight seal in seconds.**
- **Pipe is held in perfect alignment.**
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Save time! Replace ordinary back-up flanges in your stock lines with Overly Vee-Grips! Easily put on or taken off in seconds. Pipe joints are held in perfect alignment, assuring a smooth flow of stock. They also improve the appearance of your stock line installations.

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OVERLY'S INCORPORATED

Box 468 Neenah Wisconsin

For more data circle 156 on Post Card

area, and a soft diffused underlighting is provided by two recessed 8-watt fluorescents under the viewing table base.

Underlighting and overhead light may be positioned separately by means of friction collar disc joints. The table also can be adjusted to lie flat or slant. Magnification provided by the 6- by 6-in. lens is said to have good resolution and high visual acuity. *Fostoria Corp.*

Circle No. 23 on Readers' Service Card

Microstraining units

Microstraining units to carry out tests on water, consist of revolving drums covered with woven stainless steel fabric having apertures as fine as 23 microns. Micro-organisms and suspended matter in the water are deposited on the inside of the drum as the water passes through and then washed off by jet sprays into a waste hopper which discharges into a hollow axle. In comparison with other methods, the process is low in initial operating and maintenance costs besides being economical in space requirements. Flexibility of the process enables additions to be carried out quickly and economically at any time. *Glenfield & Kennedy Inc.*

Circle No. 24 on Readers' Service Card

Circuit breakers and switchgear

A completely new design of 4160-v. circuit breakers and switchgear is said to be the first clean-sweep re-design of equipment in this voltage rating in the history of the industry.

The breakers reportedly combine stored-energy closing and ironless blowout in this voltage rating, afford faster fault interruptions, faster closing of contacts, and smaller size than any other comparable equipment available today in the 4160-v. field. The types of switchgear construction available include the conventional indoor arrangement and two types of outdoor configurations; standard enclosed and full walk-in. *I-T-E Circuit Breaker Co.*

Circle No. 25 on Readers' Service Card

Paper trimming knife

The new Jet-Cut is said to be the only paper trimming knife with the entire face area polished as well as having a polished bevel cutting edge. This polished face, together with hard alloy steel construction, is claimed to be instrumental in reducing drag and maintaining accuracy and long blade life. The Jet-Cut is available in stock to fit all makes and models of cutters. *Ohio Knife Co.*

Circle No. 26 on Readers' Service Card

Air comparison pycnometer

An entirely new principle for rapid non-destructive volume, density and porosity measurement on irregular, powdered and porous solids is incorporated in the air comparison pycnometer. It is said to be a valuable laboratory and field instrument for saving time on measurements formerly done with displaced liquids or involving direct pressure determination.

Important known and possible areas of application include: (pulp and paper) quality control and moisture determination; (chemicals and petrochemicals) density of powdered and granular polymers, condition of porous catalysts, etc; (construction materials) moisture and sap content in lumber; etc. *Houston Instrument Corp.*

Circle No. 27 on Readers' Service Card

Refiner

Presenting a new concept in refiner design, the Disco-finer is said to provide exceptional precision and high quality of stock preparation, due to the new design principle, which introduces automatically self-aligning rotor and stator plates that remain in perfect parallel relationship. Due to the semi-conical design of rotor and stator, mis-alignment and distortion of discs is eliminated.

Used for either fibering or defibering, and designed for high production, the Disco-finer is said to provide 500 to 700 connected hp. The manufacturer claims that the power consumption/ton of production is very low and sustained maintenance costs of the Disco-finer may be at a minimum. *Morden Machines Co.*

Circle No. 28 on Readers' Service Card

Complete Service

DESIGN
by our own engineering staff

INSTALLATION
by our own construction crews

MAINTENANCE
by our own service specialists

of Corrosion-Resistant

LININGS and TILE TANKS

Designed and installed to meet the exact chemical and physical requirements of each installation, Stebbins linings and tile tanks are industry-famous for their efficiency and economy.

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For more data circle 157 on Post Card

FABRI DIGESTER CHIP VALVES

... a vital part of automation in modern pulping processes. They save valuable minutes each time a digester is charged, giving more cooks and producing more pulp.

Fig. 46
Fabri Digester
Valve

FABRI DIGESTER CHIP VALVES reduce manual labor, releasing manpower for more productive duties.

- Eliminate time-consuming bolting of conventional digester cover.
- Resilient seat for tight closure.
- Deep Gate stuffing box with lantern ring packing.
- Approved by insurance underwriters.
- Cylinder or Electric motor operation.

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2100 N. Alberta Avenue
P.O. Box 4352 Portland 8, Oregon

For more data circle 158 on Post Card

New Products . . .

Pump-through refiner

Newest in the Bauer 440 series of pump-through refiners, is the recently developed No. 441-44 model. The No. 441 is reported to be an improved and simplified version of earlier models which have become well known in the pulp and paper industry for their fiber development efficiency.

With a capacity of 300 tons of pulp/day, the refiners have an increase in horsepower (up to 1000 hp.). Control of the degree of refining is said to be fast, easy and accurate, through an electro-hydraulic servo-mechanism which adjusts position of the plates. Stainless steel is used for all parts of the refiner which come in contact with pulp. *Bauer Bros. Co.*

Circle No. 29 on Readers' Service Card

Electronic transmitter

The Taylor 726T "universal" electronic transmitter is said to have all around utility and adaptibility. The 726T reportedly functions with innumerable sensing elements, either new or existing, to thus provide many variable measurements. In many instances, states the manufacturer, purchase of the entire unit may not be necessary. The addition of certain sub-assemblies to existing installations may be all that is required.

An indicating instrument, with either an ac or dc electric output, the transmitter is designed to function with any one of several dozen primary elements. Measurements might be absolute, differential, gage, or volumetric pressure; load; shaft position; or temperature. *Taylor Instrument Co.*

Circle No. 30 on Readers' Service Card

Vinac AA-63

Developed for adhesives compounding, Vinac AA-63 is compatible with solutions of fully hydrolyzed polyvinyl alcohol. The non-creaming properties of this product are said to prevent fully hydrolyzed PVA solutions from separating upon aging and impart more water resistance to finished adhesives.

Other characteristics claimed for Vinac AA-63 are: normal compounding with solvents and conventional plasticizers; excellent mechanical stability; low viscosity index; and good machining properties. *Colton Chemical Co.*

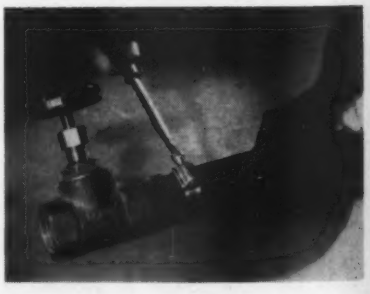
Circle No. 31 on Readers' Service Card

Chlorinated polyether

Extruded Penton sheet, formerly available only in narrow widths, is now being manufactured in 48-in. rolls.

This corrosion-resistant lining material is said to have a wide range of chemical resistance at elevated temperatures. Two standard sheet thicknesses are available: .040 and .062 in. The heavier gauge material is designed for conditions of severe abrasion. *National Vulcanized Fibre Co.*

Circle No. 32 on Readers' Service Card



Plastic pipe

Poly III, a new high-density polyethylene pipe is being made available in sizes ½ thru 2 in.

The pipe has a life expectancy of 50 years and is connected with polypropylene resin fittings, said to be leak proof. The manufacturer further states the pipes are easily installed and useful for piping corrosive acids, brine and alkaline solutions. *Crane Co.*

Circle No. 33 on Readers' Service Card

NEW LITERATURE

Books

INVESTING AND LICENSING CONDITIONS IN 34 COUNTRIES. Prepared and Published by Business International, 200 Park Ave. South, New York 3, N. Y. 108 pp. $60.00.

According to this report, investors in Europe are now faced with fewer restrictions on trade, investment and currency than previously. Furthermore, the general investment climate in Africa and Asia is continuing to improve, but rising anti-Americanism is some Latin American countries is posing fresh problems for U.S. business.

This report also shows where conditions in 34 major world markets favor investors and licensors and where there are dangers. In country-by-country analyses it describes the laws and regulations governing investments and licensing agreements and tells how they are applied in practice to American companies.

TROPICAL SILVICULTURE. Published by the Food and Agriculture Organization of the United Nations in three companion volumes: Vol. I, 190 pp. $2.00; Vol. II, 415 pp. $4.00; Vol. III, 101 pp. $1.00.

This study sums up the status of tropical silviculture with particular regard to natural regeneration as a guide to future efforts in developing optimum silvicultural practices. It is based on a series of general invitation papers on this topic presented at the Tropical Section of the Fourth World Forestry Congress.

Booklets

EQUIPMENT FOR PEST AND DISEASE CONTROL is the title of a booklet recently made available by the Food and Agriculture Organization of the United Nations. According to this report, the application of pesticidal dusts, dilute sprays, concentrated sprays and aerosols, for the control of pest and disease in agriculture and forestry, has become widespread. This paper describes present practices in North America and, besides dealing with insecticides and fungicides, includes information on equipment and methods for applying the new herbicides, silvicides, foliage nutrients and fertilizers.

USDA Reports

THE FOLLOWING RESEARCH REPORTS may be obtained from U. S. Forest Products Laboratory, Madison 5, Wis.: No. 2188, Chemi-mechanical Pulps from Various Softwoods and Hardwoods; No. 2181, Pulping and Papermaking Experiments on Redwood; No. 2180, Pulping and Papermaking Experiments on Quaking Aspen from Colorado.

THE FOLLOWING U. S. DEPT. OF AGRICULTURE FOREST SERVICE PUBLICATIONS are obtainable from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.: Production Research Report No. 32, Natural Regeneration of Swamp Black Spruce in Minnesota Under Various Cutting Systems; Technical Bulletin No. 1207. Soil Moisture Depletion Under Several Piedmont Cover Types.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Centrifugal air compressor

Clark Bros Co. has just published a new 20-page bulletin which introduces the "Isotemp" packaged centrifugal air compressor line for air separation plants and industrial use. Complete illustrations and descriptions of all major design features are incorporated in the bulletin.

Circle No. 34 on Readers' Service Card

Thermocouple components

Minneapolis-Honeywell Regulator Co. announces a catalog containing specifications and ordering information on replaceable components for Honeywell thermocouple assemblies. Components covered are bare elements, elements with insulators, insulators, metal and ceramic protecting tubes, heads, blocks, connectors and miscellaneous fittings.

Circle No. 35 on Readers' Service Card

Platform trailers

Birmingham Mfg. Co. Inc. welcomes your request for a four-page brochure which gives information on their line platform trailers. The brochure contains specifications, schematic diagrams, illustrations, and cutaway diagrams as well as a descriptive text.

Circle No. 36 on Readers' Service Card

Pump drives & accessories

Eco Engineering Co. has issued a catalog illustrating and describing direct electric motor drive units, air motor drives, fixed and variable speed belt drives, hydraulic and mechanical vari-speed drives, portable units, submerged pumping units and some of the improved accessories available from stock to users of Eco rotary, gear and centrifugal pumps.

Circle No. 37 on Readers' Service Card

Resin development

National Starch & Chemical Corp. has compiled and made available a new booklet on polyvinylidene chloride lates, Resyn 3600. The booklet describes fully the physical and chemical properties of Resyn 3600, both in latex and film forms. It also specifies degrees of resistance to water vapor and common gases at varying film thicknesses; formulating information; chemical resistance data; and recommended techniques for coating and handling.

Circle No. 38 on Readers' Service Card

Belt conveyor idlers

Link-Belt Co. announces the availability of a new booklet containing selection data on 60 new 35° deep trough idlers and 24 new additions to the line of 45° idlers. Conveyors equipped with deep-trough idlers are said to permit greater capacities than the same conveyors with 20° idlers because of greater cross-sectional loads. This booklet contains capacity ratings and design information for 30° idlers and lists 12 types of 35° and six types of 45° idlers for belt widths from 24 to 60 in.

Circle No. 39 on Readers' Service Card

Waste paper baling

Acme Steel Co. has made available a report describing the methods used by various companies to bale waste paper with steel strapping. This manufacturer claims its fully powered A4 steelstrapper is particularly suited for this work. Air power does the tensioning, sealing and cutting off of the flat steel strapping. Tension of the steel strapping is predetermined so that bales are uniformly compact and equal in size and shape.

Circle No. 40 on Readers' Service Card

Synchronous motors

Electric Machinery Mfg. Co., in a single-page bulletin, illustrates and describes their line of pedestal-bearing type, heavy-duty, synchronous motors. These motors are available at 600 hp. and larger with speeds ranging from 1800 to 500 rpm with 0.8 or 1.0 PF. They operate on standard voltages, 50 or 60 cycle.

Circle No. 41 on Readers' Service Card

Equipment handbook

General Industrial Co. is offering a one-year's free subscription to their periodical. These publications feature detailed descriptions of new inventions, unique tools, and other devices of executive interest. They also contain illustrations and descriptions of office and factory furniture and equipment.

Circle No. 42 on Readers' Service Card

Polymers

Union Carbide Corp. welcomes your request for a new brochure describing Bakelite Brand vinyl ethyl ether polymer bases for pressure-sensitive adhesives. These adhesives are said to remain flexible over a wide temperature range and demonstrate good resistance to aging.

Circle No. 43 on Readers' Service Card

Colour index

The American Association of Textile Chemists & Colorists announces the availability of the Second Edition of the Colour Index. These four volumes establish an international language for dyes and pigments and include information

on methods of application, colorfastness, chemical structure, characteristic reactions, index of products and trade names, fastness tests and rating methods, new and old Colour Index Numbers, and a hue indication chart.

Circle No. 44 on Readers' Service Card

Polyethylene bulk handling

U. S. Industrial Chemicals Co. has published a booklet on the advantages of bulk purchasing and handling of polyethylene resins. The booklet analyzes, with photographs, diagrams, charts and tables, the factors to be considered in bulk ordering and handling of these materials.

Circle No. 45 on Readers' Service Card

Decade of Incentive

McCann-Erickson Inc. is offering a 30-page study, in five languages, of economic prospects for the Sixties in 20 countries of the Free World. This report includes a separate section with 33 charts highlighting many elements of growth situations.

Circle No. 46 on Readers' Service Card

Technical

SALES — SERVICE

Major multi-divisional, listed CHEMICAL concern has outstanding openings for men currently engaged in, or having previous experience in sales, customer service or product application of resin sizes & allied chemicals to the Paper Industry. Eastern U.S.A. location.

Technical degree desired. Position offers excellent growth potential, liberal earnings & full employee benefit program. Send complete resume including salary requirements to Director of Personnel, Box 705, The Paper Industry.

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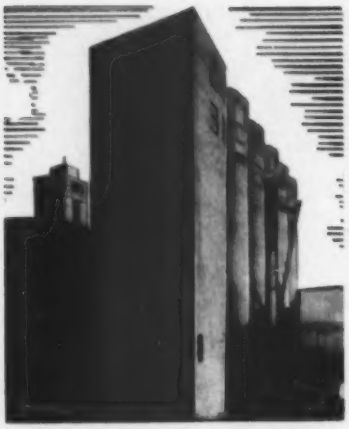

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Equip Your Digester House with a

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Eliminate stair climbing — save time — reduce employee fatigue. The endless belt provides continuous up and down transportation to and from sampling and operating floors. Easy and safe to operate with ready-at-hand stop and go controls and the exclusive Humphrey Safety Features.

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For more data circle 159 on Post Card

Design Engineer

The rapidly expanding requirements of our engineering department require the addition of a design engineer of proven capability. The man we seek must be familiar with paper machine design or have experience in heavy machinery. He must be willing to work on the board sufficiently to finalize his layouts so the job can be finished by detailers. He must have leadership qualities to assume increasing responsibility in a growing organization.

Please reply with resume & present salary to:

Personnel Director
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Midwest Multi-Plant Paper Board and Carton Manufacturer with well established paper mill in Iowa has immediate opening for plant chemist. A degree in Chemistry or related field and minimum of 2 years experience in Paper Mill Chemistry is required. Additional opening for recent graduate in Regional Technical Department. These positions offer good starting salaries and excellent promctional opportunities to Regional Research and Management. Our employees know of these openings. Reply in confidence to Box 1033, Hutchinson, Kansas.

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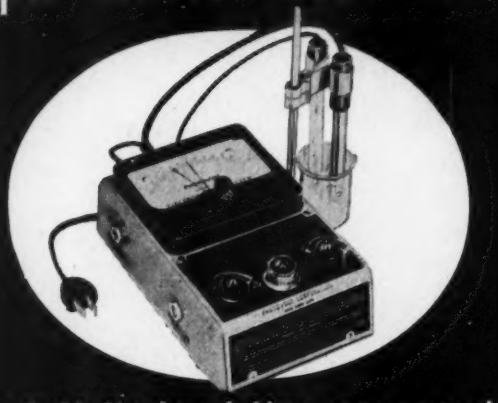
pH Meter MOD. 115



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Available in October

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Compiled and edited by
A. W. J. Dyck

Editorial Director, The PAPER INDUSTRY

Originally published as a series of articles in The PAPER INDUSTRY from November 1958 to June 1960.

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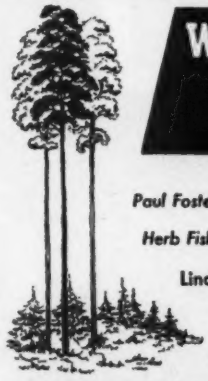

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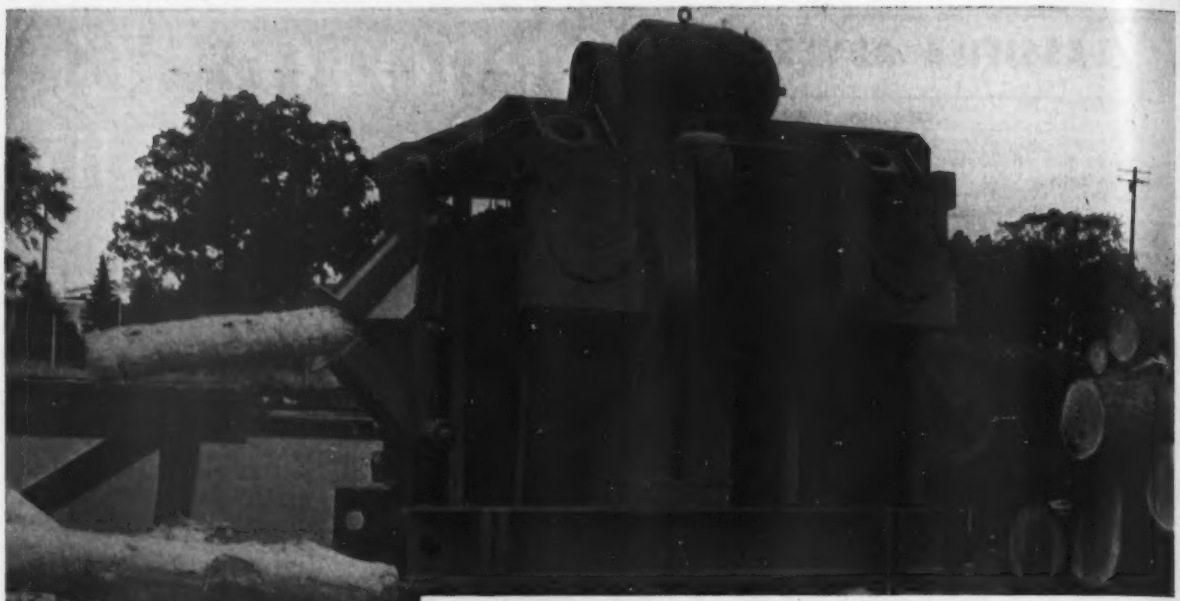

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In Canada:
Sherbrooke Machineries Limited
Sherbrooke, Quebec

THE IMPCO S20-5 BARKER FOR HARDWOOD OR SOFTWOOD FROZEN OR CROOKED!

The S20-5 delivers a dependable high annual production rate of cleanly barked logs at very low maintenance and operating costs. This dependability, due to its extra-rugged design, is maintained with frozen crooked hardwood. Present installations average 250 cords/day with reported maintenance costs of 3 to 4 cents/cord, on logs in the 3″ to 19″ diameter range, down to 5′ in length.

For more data circle 163 on Post Card

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.	
No. 1 white shirt cuttings	13.00—	13.50
Soft unbleached muslins	15.50—	16.00
Fancy shirt cuttings	4.50—	5.00
No. 1 percales	5.50—	6.00
No. 1 washables	2.25—	2.50
No. 1 light sleslas	6.50—	7.00
No. 1 light prints	4.75—	5.00
Light flannelettes	6.50—	7.00
Cottonades	2.75—	3.25
Blue overall cuttings	6.75—	7.25
Blue cheviots	6.75—	7.25
Canton flannels, bleached	10.50—	11.00
Canton flannels, unbleached	10.50—	11.00
Osnaburg cuttings	9.50—	10.50
Underwear cuts, bleached	14.50—	15.00
Underwear cuts, unbleached	14.50—	15.00
Sun tan khaki cuttings	5.00—	5.50
American linen cuttings	6.75—	7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b New York:

	per cwt	
No. 1 roofing (Chicago)	.50—	.55
No. 2 roofing (Chicago)	.40—	.45
Twos and blues, repacked	1.75—	2.00
Thirds and blues, repacked	1.50—	1.75
No. 1 whites, repacked	—	
No. 1 whites miscellaneous	—	
No. 2 whites, repacked	—	
No. 2 whites, miscellaneous	—	

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

Nominal:
- New dark cuttings
- New mixed cuttings
- New light sleslas
- Light flannelettes
- Unbleached cuttings
- New white cuttings
- New light oxfords
- New light prints

Old Rags

per cwt.

Nominal:
- No. 1 white linens
- No. 2 white linens
- No. 3 white linens
- No. 4 white linens
- No. 1 white cottons
- No. 2 white cottons
- No. 3 white cottons
- No. 4 white cottons
- Extra light prints
- Ordinary light printe
- Medium light prints
- Dutch blue cottons
- French blue cottons
- French blue linens
- Checks and blues
- Linsey garments
- Dark cottons
- Old shopperies

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manilla rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	95.00—	100.00
No. 1 hard white shavings	80.00—	85.00
No. 1 soft white shavings	50.00—	55.00
Soft white shavings, uncoated	60.00—	65.00
Fly leaf shavings No. 1	20.00—	25.00
Fly leaf, woody, No. 1	20.00—	22.50
Mixed colored shavings	16.00—	18.00
No. 1 books and magazines	18.00—	20.00
Ledger stock, white, No. 1	40.00—	45.00
Ledger stock colored, No. 1 (Midwest ship)	30.00—	32.50
Now manila envelope cuttings (free of groundwood)	65.00—	70.00
New manila envelope cuttings (containing groundwood)	45.00—	50.00
Manila tab cards	55.00—	57.00
Colored tab cards	42.50—	45.00
New northern kraft envelope cuttings	60.00—	65.00
Triple sorted kraft, 100%	35.00—	37.50
No. 1 old kraft	25.00—	
White news cuts, No. 1	32.50—	37.50
No. 1 overissue news	15.00—	17.00
Folded news, special	13.00—	14.00
Folded news, ordinary	11.00—	12.00
Old corrugated boxes	15.00—	16.00
New jute corrugated cuts	19.00—	20.00
Mill wrappers	9.00—	11.00
Boxboard cuttings	4.00—	5.00
No. 1 mixed paper	1.00—	6.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
1-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	160.00—
L. c. l., ton	170.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	10.00— 12.00
300-mesh bags, c.l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— .35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.25—
Glycerine, refined (CP, USP) 99%, drums c. l., delivered lb.	.30⅞—
Litharge, commercial powdered	
Barrels c. l., works, freight equaled lb.	.14¼—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	17.75—
N	17.85—
WG	18.10—
WW	18.25—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	12.00— 12.25
N	12.35— 12.45
WG	12.55—
WW	12.75— 12.85
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.65—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—
High-tinting, drums, c. l., lb.	.14⅜—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15⅜—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft semi-bleached southern	140.00—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50

Book Paper (f.o.b. Chicago, c.l. skids per cwt):		
No. 1 enamels		20.80
No. 2 enamels		19.80
Machine-coated, 45- to 100-lb.	15.55—	19.00
60-lb. + uncoated offset, 25 × 38 (2000 lb.)		22.25
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)		21.10
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt	
100% rag		—
75% "		—
50% "		—
25% "		—
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):		
100% rag		—
75% "		—
50% "		—
25% "		—
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):		
No. 1		—
No. 2		—
No. 4		—
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):		
No. 1		—
No. 2		—
No. 4		—
Newsprint (contract base price)	per ton	
Rolls, standard		135.00
Sheets	Standard differentials	
Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt	
70-lb. and heavier		9.00
60-lb		9.25
50-lb.		9.50
40-lb.		9.75
35-lb.		10.25
30-lb.		11.00
25-lb.		11.75
20-lb.		12.75
No. 1 Kraft Butcher — Pink	per cwt	
40-lb. only		10.50

(Sheets — Plus 50c cwt)

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B&W offers you . . .

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- mutual understanding toward achieving the most satisfactory and economical tube performance
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PAPER INDUSTRY

Whither?

... in production, processes, new products, markets

Moulded fabric suction boxes

Moulded fabric suction boxes, developed by the Gatke Corp., require dressing only once in 6-15 months in contrast to a bi-weekly dressing needed with wooden covers, the manufacturer reports. The smoothness of the moulded suction boxes further contributes to marked reduction of friction, extension of wire life, and lower maintenance costs.

Pillow cases from Kaycel

Kaycel, a non-woven material produced by Kimberly-Stevens Corp., is now used in pillow cases by the airlines. Their use eliminates laundry expense since the low-cost pillow case can be thrown away after use. Kaycel is also widely used in hospital surgical packs.

Leaky pipes fixed with thermosetting epoxy resins

Small holes and cracks in pipes can be fixed in less than half an hour, and without taking the lines out of service, with the use of patches, tape and epoxy resins. The procedure consists of cleaning the area around the leak, putting a patch over the leak, wrapping a screen-like tape around the patch, taping a pressure-gun fitting over the area, and forcing the epoxy resin through the fitting.

A new process of bonding glass to inexpensive steel

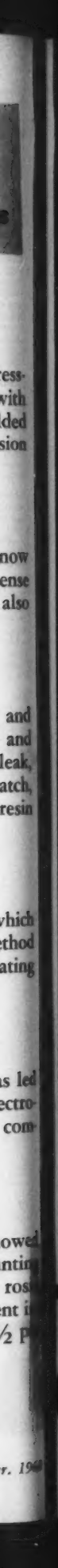
A. O. Smith Corp. has developed a new method of glass-coating steel which permits the use of 0.08-0.2 per cent carbon steel to be coated. The method eliminates the need for a "ground-coat" of glass and rquires instead a coating of nickelous oxide, silica, and barium metaphosphate.

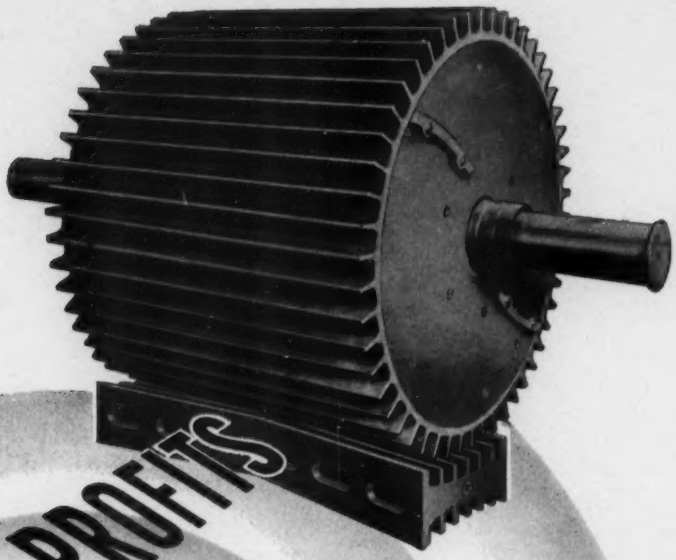
Cyanoethylated cellulose for electroluminescent panels

A highly cyanoethylated cellulose with unique electrical properties has led to the development by G. E.'s Lamp Division of thin and flexible electroluminescent panels that are "five times brighter than any other now commercially available". The panels should reach the market by October.

New results with CMC in papermaking

Recent results with CMC (carboxy methyl cellulose) in papermaking showed that (1) 35 to 40 per cent of the rosin size is replaceable by CMC amounting to a 30 per cent reduction of the cost of sizing; (2) CMC improves the rosin size retention; (3) CMC improves filler retention as shown by 25 per cent increases of ash contents of paper as a result of the addition of 1 to 1½ per cent CMC to the furnish.





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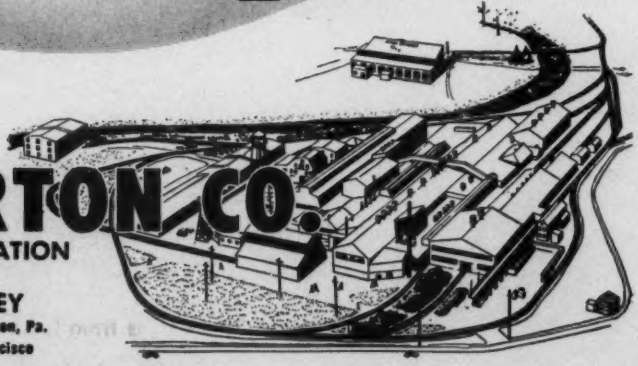

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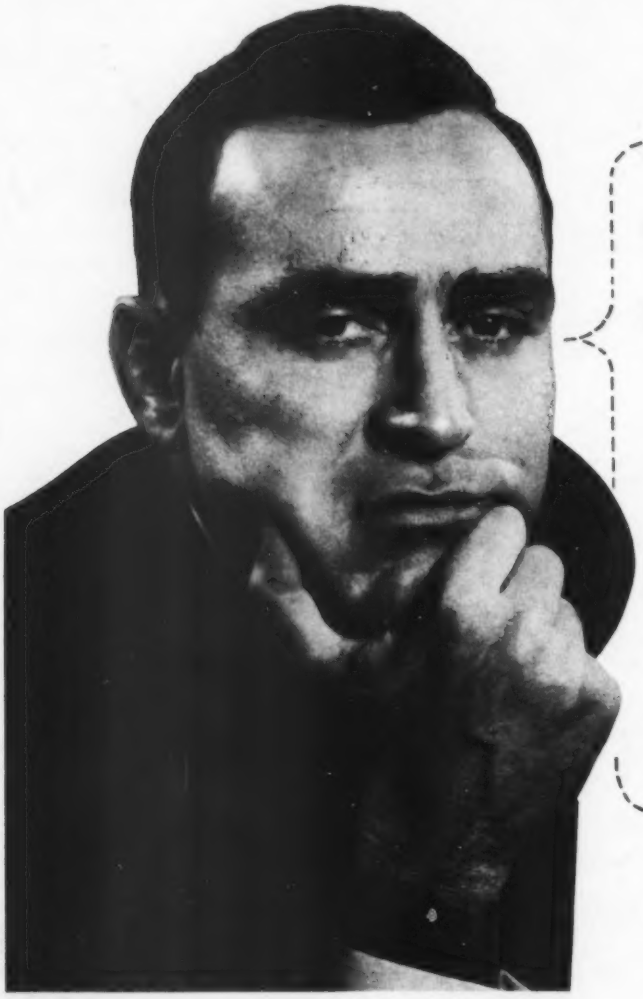
Thinking of coating or filling with clay?



Should we use a trailing blade... or an air knife?

Maybe it should be a roll coater... or a reverse roll?

What about a size press?

Double coating? Simultaneous or successive?

On or off the machine?

Wet or dry storage?

Fill at the secondary headbox?

Best place to furnish the clay?

There are plenty of tough decisions to make when it comes to coating or filling paper with clay. Using clay successfully involves a lot more than selecting a grade.

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Georgia Kaolin technical assistance goes beyond ideas and opinions. The Sales Service Department operates pilot coating machines which can demonstrate the effects, on your own raw stock, of different formulations and various methods of coating. These facilities, plus Georgia Kaolin knowledge and skill, can be an all-important adjunct to your own research.

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?